Index for Volume 79

AUTHOR AND SUBJECT INDEX. Page numbers of illustrations are in parentheses. Pages indicating errata are in italic type

Abeles, F., 1184
Abney, T. S., 1136
Aboshosha, S. S., 1175
Abstracts
—annual meeting, 1135
—North Central Division, 1003
—Pacific Division, 908
—Southern Division, 371
Abt, J. J., 1188
Acremonium spp., endophyte, mitochondrial plasmids in, 1205
—*A. coenophialum*: fertilizer and age effect on detection, 1212; growth regulator effect on, 1144
Adams, G. C., 404, 568, 1143, 1175
Adams, P. B., 1345
Adaskaveg, J. E., 1171, 1183
Adee, E. A., 873, 1163, 1222
Adee, S. R., 1217
Adkins, C. R., 1204
Adkins, S. T., 1197
Adkisson, K., 1176
Afek, U., 736, 1138
African cassava mosaic virus, spatial spread, geostatistics and kriging technique, 913
Agar, brand effect on efficacy of medium, 1209
Agaricus bisporus, La France disease of, dsRNA in cultures, 1272
Agostini, J., 1180
Agrobacterium spp.: antibiotic-resistant mutants of, 912; on cherry seedlings, population dynamics, 1215; on muscadine, biotype determination, 1182; on muscadine, DNA probes for pathogenicity, 1139; on muscadine, seasonal variation, 373
—*A. radiobacter*, conjugal transfer of plasmids, 909
—*A. rhizogenes*: genes in root induction and growth, 1157; *rol* genes of, effect on transgenic plants, 1005
—*A. tumefaciens*: cellulose synthesis genes, regulation, 1210; on chrysanthemum, response to hormone preconditioning, 1198; on grapevine, biovar 3, monoclonal antibody for, 995; Ti plasmid, conjugal transfer and opine catabolic function, 1178; wild blackberry strains, characteristics, 1181
Ahl, P., 258
Ahn, S. W., 1183
Akem, C. N., 375
Akhtar, M., 800, 1151
Albregts, E. E., 1136
Alderman, S. C., 837, 1202
Aldrich, J. H., 1203, 1206
Alexander, J. D., 1189
Alexander, S. A., 1220
Alfalfa
—anthracnose of, race virulence, 750
—downy mildew, minor gene resistance accumulation, 721
—Fusarium crown rot, insect defoliation effect, 1146
—nematode and root rot infection, relation, 909
—Phytophthora root rot, screening technique, 1202
—Phytophthora root rot and Sclerotinia crown and stem rot, sewage sludge effect on, 1146
—rust of, epidemic waves, 1162
—Sclerotinia crown and stem rot, cultural control, 1136
—Verticillium wilt: in California, 1202; photosynthesis and stomatal response, 1144
Alfalfa mosaic virus, coat protein genes of, transgenic plants, 1284
Ali, M. E. K., 1148
All, J. N., 1213
Allen, W. R., 1149
Almeida, R. T., 1139, 1222
Almond, brown rot blossom blight, fungicides for, 911
Aloi, C., 1176
Alternaria spp.
—*A. macrospora*, on cotton, sporulation, environment and host effect, 263
—*A. solani*: on potato, control, simulation models, 590; on potato, resistance components, 511
Alvarez, A. M., 322, 984, 1191
Amante, A., 1185
American Phytopathological Society
—abstracts (see Abstracts)
—annual report, 8
—award listing, historical, 59
—Award of Distinction, 58
—CIBA-Geigy Award, 56
—Fellows, 47
—index to authors of APS presentations, 1224
—Lee M. Hutchins Award, 57
—officers, representatives, and committees for 1988–1989, 44
—plenary session, D. A. Fischhoff, 38
—president's forum, D. A. Holt, 40
—presidential address, A. R. Weinhold, 33
—Ruth Allen Award, 55
Ammon, V., 371
Anciso, J. R., 1170
Andersen, P. C., 1137, 1203, 1206
Anderson, E. J., 1284
Anderson, J. D., 1071
Anderson, P., 1215
Anderson, R. L., 1220
Andres, M. W., 1136
Andrews, J. H., 1177
Andrews, R. E., Jr., 1261
Antonov, L. S., 1190
Appel, D. N., 1318
Apple
—*Athelia bombacina* effect on *Venturia inaequalis*, 1177
—*Botryosphaeria obtusa* on, eradicant and protectant fungicides, 1206
—black rot, temperature and wetness duration, 440
—Botrytis rot of: biocontrol, 1215; *Trichoderma* and integrated control approaches, 1153
—fungicide applications, reduction, 1005
—scab of, apple scab prediction, Mills's criteria, 304
—scar skin and dapple apple viroids, detection using cRNA probes, 1175
—*Venturia inaequalis* on, temperature and fruit age relation, 1164
Aquino, V. M., 1179
Aragaki, M., 1212, 1217
Araki, F., 1091
Arauz, L. F., 440, 1206
Aref, N. M., 451
Ariovich, D., 382
Armillaria spp., phenol oxidases in five biospecies, 1150
—*A. mellea*, monoclonal antibodies produced against, 1165
—*A. ostoyae*, on Douglas-fir, growth reduction from, 482
Armitage, C. R., 1003
Arnold, W. R., 1170
Arny, D. C., 379
Arora, D. K., 1190
Arroyo, T., 1219
Artichoke, root and crown decline, etiology unknown, 1194
Ash
—decline of, in Arizona, 1149
—green and white, virus and mycoplasmalike organism infection, 579, (581)
—growth decline, mycoplasmalike organisms associated with, 1221
Asparagus
—allelochemical from, effect on mycorrhizae, 1223
—crown and root rot, heterokaryosis in *Fusarium*, 88
—somaclonal regeneration of, *Fusarium* resistance variation, 1201
—tissue culture, *Glomus* spp. studied, 1222
—virus-infected, Fusarium crown and root rot susceptibility increased by, 253
Aspen (see also *Populus*), hypoxylon canker of, moisture stress effect in tissue culture, 315, (316), 318
Aspergillus spp., green pigmentation, melanin inhibitors, 1212
—*A. flavus*: benomyl resistance, transformed with homologous gene, 1204; on cotton, pectinase activity and virulence relation, 1208; on cotton, virulence of strains pathogenic to, 808; detection in soil and crop debris in fields of Iowa, 1187; strains of, aflatoxin contamination, 1153; vegetative compatibility groups, 1186
—*A. nidulans*, transformation with plasmid DNA by electroporation, 844
Assemi, M., 1171
Atkinson, M. M., 974
Auchmoody, L., 1143
Austin, H. K., 1168
Avocado, Phytophthora root rot, flooding effect on gas exchange and growth, 204
Aycock, H. S., 1364, 1368
Aycock, R., 819
Aylor, D. E., 146
Azad, H. R., 903, 1179
Azalea
—Phytophthora crown and root rot, ELISA kits for diagnosis, 1139
—Phytophthora root rot, *Penicillium* as biocontrol agent, 1159

Bacillus spp., on sugar beet rhizoplane, root print technique for determination, 1131, (1133)
—*B. subtilis*: biocontrol agent for geranium rust, 367; bioprotectant for *Rhizoctonia* infected cotton seedlings, 373; on maple, survival, 373

Backman, P. A., 1167, 1188, 1203
Bacteria
—growth on plants, detection and quantification, 1181
—ice nucleation activity, toothpick assay, 1181
Bactericide, copper, conjugative plasmid associated with resistance to bacteria, 861
Baek, S.-R., 1156
Bailey, T. B., 1261
Baker, C. A., 1213, 1214
Baker, C. J., 555, 750, 974, 1199, 1208
Baker, J. M., 1223
Baker, N. K., 1187
Baltazar, B. M., 1173
Banana
—black sigatoka disease, weather-based forecaster for, 1219
—crown rot, thiabendazole-coated pad for control, in Windward Islands, 1195
—Fusarial wilt, factors affecting, 1181
Bandy, B. P., 1195, 1199
Banttari, E. E., 1139
Barash, I., 1136, 1177
Barbara, D. J., 1353
Bardinelli, T. R., 1212
Barkdoll, A. W., 1146
Barker, K. R., 1135
Barley
—disease progress in pure and mixed stands, 968
—leaf rust resistant genes, mapping on chromosomes, 1207
—net and spot blotch of, resistance screening method, 1201
—net blotch, yield effect, 1213
—powdery mildew, resistance enhanced by silicon, 1198
—Rhizoctonia root rot of, glyphosate application effect, 1217
Barley yellow dwarf virus
—aphid transmission, nonspecific, 942
—cereal aphid infection from, 909
—cross protection and relations, 1174
—monoclonal antibodies for use in strain detection, 869
—on oats, soil and aeroponic culture, 1003
—PAV strain, sequence and coat protein, 1215
—purification, antiserum production, 1174
—serological complexity, 1213
—serological relationships, 1214
—titer in sister oat lines, 1197
—transmissible from different sources, 1353
—virus content in leaves, 1348
Barnes, L. W., 984
Barnett, O. W., 371, 377, 951, 1174, 1175
Barnett, W. W., 1137
Bartolome, H. T., 1223
Barton-Willis, P. A., 573
Bartz, J. A., 1187
Basden, T., 1169
Bashan, B., 832
Bastawsi, O. A., 1217
Batson, W. E., Jr., 373, 1192
Baudoin, A. B. A. M., 1202
Bauer, D. W., 1156, 1211
Bauske, E. M., 1148
Baxter, L. W., Jr., 951
Bayman, P., 1186
Bays, D. C., 1157, 1196, 1214
Beachy, R. N., 1284
Bean mild mosaic virus, contaminant in greenhouse virus studies, 1188
Bean yellow mosaic virus
—on clover, tolerance evaluation, 230
—monoclonal antibodies, coat protein amino acid sequence comparisons, 1157
—protein A-gold labelling of, 374
Beaupre, C. M.-S., 1147
Beaver, R. W., 373, 1181
Beck von Bodman, S., 1178
Bedker, P. J., 1142
Beer, S. V., 1156, 1211
Beet curly top virus, genomic characterization of isolates, 1158
Beet western yellows virus
—detection in potato samples, failure, 908
—monoclonal antibodies for strain discrimination, 869
Bélanger, R. R., 315, 318
Beleid-El Moshaty, F., 1166, 1180
Bell, A. A., 1145
Bell, D. K., 376, 377
Bell, J. B., 1215
Bemisia tabaci, cucurbit leaf curl virus vectors, acquisition and retention in vector, 109
Ben-Moshe, H., 1188
Bender, C. L., 1159, 1211
Benedict, A. A., 322, 984, 1191
Benedikz, P. W., 1217
Benner, H. I., 1261
Bennett, A. R., 1152
Ber, R., 562
Beremand, M. N., 170, 1172
Berestecky, J., 322
Bergdahl, J. A., 1222
Berger, P. H., 1135
Berger, R. D., 1162, 1179
Berggren, G. T., 499, 1163, 1212, 1233
Bergstrom, G. C., 1148
Berkett, L. P., 1222
Berling, C. H., 584
Bernard, E. C., 374
Berndt, L., 1153
Bernhard, F. R., 1185
Bernier, C. C., 740
Bernstein, B., 371
Bertrand, P. F., 1155
Bérubé, J. A., 1165
Best, V. M., 1183
Beupre, C. M.-S., 1147
Beute, M. K., 136, 1146, 1201
Bhairi, S., 1172
Bharathan, N., 1213
Bhat, R. G., 1185, 1186
Bhatt, P., 1222
Bhatti, M. A., 908, 1147
Biggs, A. R., 627, 1154
Biles, C., 1184
Biles, C. L., 375, 856
Biological control
—*Bacillus subtilis* for geranium rust, 367
—crop rotation for *Rhizoctonia solani*, 376
—*Erwinia herbicola* for *Fusarium culmorum* and *Puccinia recondita* on wheat, 990
—fungi to *Sclerotinia* spp., 1345
—*Gliocladium virens* for *Pythium* and *Rhizoctonia* in soilless mix, 361
—*Myrothecium roridum* for *Phytophthora cinnamomi*, 1079
—nematode biocontrol agent, assay in Clandosan-amended soil, 1153
—*Pseudomonas* as agent, enhancement by constitutive antibiotic biosynthesis, 1160
—*Pseudomonas fluorescens*: to *Gaeumannomyces graminis*, role of antibiosis, 143; on pea roots, 1327; for tobacco black root rot, role of iron, 584
—*Pythium* on sweet corn, bio-priming seed treatment, 1216
—*Rhizoctonia* and *Laetisaria*, longevity, 1004
—Rhizoctonia seedling diseases, bedding plant nurseries, 1159
—root-infecting fungi using fungi and management, 1153
—*Septoria silybi* for milk thistle, 1085
—*Trichoderma* against *Fusarium oxysporum*, in rhizosphere, 198
—*Trichoderma* and *Gliocladium*, biocontrol formulation, 1160
Bipolaris spp.
—*B. maydis*, race T: on corn, sporulation and peroxidase, 1151; on corn, sporulation related to temperature, peroxidase and electrolyte leakage, 800; polypeptides and toxin, 1004; xylose effect on polyphenoloxidase, 1151
—*B. oryzae*, ophiobolin detected in filtrates of, use in root elongation, 1209
—*B. zeicola*, race 3, root rot factors, 1216
Bishop, A. L., 995
Bissonnette, S. M., 1003
Black, L. L., 505, 726, 1189
Blickle, W., 263
Block, C. C., 1160
Bloomberg, W. J., 482, 1143
Blueberry, scorch disease, spherical virus association, 910
Blueberry shoestring virus
—in highbush blueberry, detection in vascular tissues, 488
—RNA quantification and antigen in vector, 1173
Blum, U., 128
Bockus, W. W., 1003, 1006, 1127, 1184
Boerma, H. R., 373, 1148
Bollich, C. N., 375
Bonde, M. R., 297, 596, 1203
Bonman, J. M., 1183, 1184
Bonnet, P., 1105
Bonsi, C., 1177
Boothroyd, C. W., 127, 380, 381
Borbon, J. C., 1192
Bordovsky, D., 1141
Bosch, U., 1187
Boscia, D., 1189
Bostock, R. M., 898, 911
Botryosphaeria spp.
—*B. dothidea*, on peach, ascospore and conidial dispersal, 635
—*B. obtusa*: on apple, temperature and wetness duration for infection, 440; ascospore and conidial germination, temperature and moisture effect, 667
—*B. stevensii*, on juniper, spore liberation and canker development, 1221
Botrytis spp., nuclei and chromosomes of, microscopic observation, 728, (730)
—*B. cinerea*: diagnostic media for detection, 1212; fungicide resistance, spray schedule effect, 1176; fungicide resistance in, in Pennsylvania, 1207; grape berry moth larval association, 651, (652-655); on grapes, canopy microclimate effect, 395
—*B. squamosa*, on onion, fungicide applications, predictive system, BLIGHT-ALERT, 493
Bouchibi, N., 912
Boudreau, M. A., 1135
Bowden, R. L., 1151, 1213
Bowen, B. D., 1213
Bowen, K. L., 152, 371, 1188
Bowers, J. H., 1166, 1223
Bowling, L. R., 1184
Bradfute, O. E., 1214
Brassica napus, fungal diseases of, control in Switzerland, 1136
Braun, E. J., 1198
Bremia lactucae, on lettuce, gene-for-gene analysis, 888
Brenneman, T. B., 371, 1147, 1155
Britton, K. O., 1203
Broad bean wilt virus, on weeds near lettuce fields in New York, 65
Broadbent, A. B., 1149
Broccoli
—bacterial soft rot: cultivar reaction, 372;

horticultural traits for predicting resistance, 1160
—head rot and yield, irrigation effect, 910
Brodbeck, B. V., 1137, 1206
Broglio, E. P., 1158
Bronson, C. R., 1173, 1204
Brooks, A. D., 1210, 1211
Browder, L. E., 1217
Brown, C. S., 371
Brown, G. E., 1381
Brown, J. K., 908
Brown, M. P., 1218
Brown, P. R., 1182
Bruckart, W. L., 1152
Brumbley, S. M., 1156
Bruton, B. D., 1196, 1203
Bryan, H. H., 1213
Bucher, G., 1221
Buechley, G., 1207
Buehring, N. H., 1192
Bull, C. T., 1155
Burger, J. T., 385
Burian, L. C., 1195
Burnes, P. M., 1166
Burr, T. J., 995
Burris, J. S., 1140
Burrows, P. M., 371, 951, 1174, 1175
Burton, H. R., 267, 271
Bush, A. L., 1198
Bush, L. P., 1144
Bushway, R. J., 1199
Butterfield, E. J., 1212
Buurlage, M. B., 1208

Cabbage, white mold of, epidemic dynamics in Florida, 1161
Cacao, black pod, IPM control strategy, 1137
Cahill, D., 417
Cahill, D. M., 1238
Cairns, J., Jr., 1168
Callan, N. W., 1216
Cambra, M., 820, 1174
Campbell, C. L., 372, 375, 1119, 1163
Campbell, H. L., 1155
Campbell, R. N., 1180
Canaday, C. H., 372, 1160
Candida spp., antagonistic to ice nucleation-active *Pseudomonas*, 275
Canfield, M. L., 1181
Cannon, S. J., 773
Canteros, B. I., 1210, 1211
Cappellini, R. A., 1153
Capsicum annuum (see also Pepper), multiple virus resistance in, 377
Carden, E. L., 1171
Carling, D. E., 1180
Carmer, S. G., 1006
Carnation, viruses of, monoclonal antibodies, 1213
Carnation ringspot virus, electrophoretic variability, 1253
Carney, B. F., 1156
Caron, M., 1222
Carotenoid, production by *Cercospora* spp., role in resistance, 180
Carroll, R. B., 1146, 1202
Carrot
—cavity spot, etiology in California, 1161
—viruses of, incidence in California, 908
Carson, M. L., 70, 1185, 1201
Caruso, F. L., 1154
Casper, H. H., 1005
Castello, J. D., 579, 1173, 1221
Castilleja miniata, blister rust of, histopathology of infection, 539, (542-545)
Castle, W. S., 1180
Cauliflower mosaic virus
—mutagenesis of gene VI, phenotype changes, 1158
—symptom comparison, promoters in transgenic plants, 1158
Celery, Fusarium yellows of, management, 1161
Cenis, J. L., 506
Cephalosporium gramineum
—conidial sporulation and survival, soil factors, 787
—on wheat, decline in monoculture, 1127
Ceratocystis spp., on ponderosa pine, mixed inoculation, 768
—*C. fagacearum*, on live oak, measurement of wilt centers, 1318
Cercospora spp.: carotenoid production by, resistance to cercosporin, 180; cercosporin accumulation, 213
—*C. arachidicola*, on peanut, infection process, 1175
—*C. kikuchii*: cercosporin synthesis in, protein association, 1136; cercosporin synthesis and pathogenicity, mutants, 1198
—*C. sojina*, race 4, ambiguity, 1148
—*C. zeae-maydis*: appressorial formation, 1147; relative humidity effect, 1005, 1147
—*C. zebrina*, on clover, seed production and quality effect, 209
Cercosporella rubi, fungicides for, efficacy, 1193
Cercosporidium personatum, on peanut
—disease detection using radiometer, 958
—partial resistance components, 136
—velocity of spread from point source, 837
Cereals and grasses, fungi pathogenic to, root infection, 377
Cervantes, L. A., 121, 1154
Cha, J.-S., 1179
Chacko, R. J., 1208
Chaisrisook, C., 1003
Chalutz, E., 1187, 1215
Chambers, A. Y., 372
Chandler, C. K., 1136
Chang, C. J., 372, 1140
Chang, H., 1204
Chang, L. P., 1154
Chang, M. M., 1207
Chang, R. J., 1168
Chang, S., 1151
Chang, T. T., 1205
Chao, C. P., 1218
Chase, T. E., 1144, 1164
Chastagner, G. A, 1169
Chatterjee, A., 1156
Chatterjee, A. K., 1155, 1156, 1178
Chaubal, R., 1175
Chellemi, D. O., 908
Chen, C. C., 235
Chen, M.-J., 235, 768
Chen, T. A., 610, 1137
Chen, W., 1185
Chen, X. M., 1207
Cheng, D. S., 1183
Cheng, Y.-H., 1257
Cherry
—bacterial canker, streptomycin resistance, conjugative plasmid association, 861
—Cytospora and bacterial cankers, control in Oregon, 1154
—green ring mottle disease of, mechanically transmissible virus association, 451, (454)
—leafspot of, factors in Pennsylvania, 1143
—sour, brown rot blossom blight of, effect of environment and inoculum density, 530
Chessin, M., 1189
Chestnut, blight, resistance screening of seedlings, 1165
Chet, I., 198, 1246
Chiang, C. C., 1184, 1207
Chickpea
—wilt and root rot, soil bulk density effect, 1147
—wilt and root rot fungi, inoculum density and temperature effect, 908
Chippindall, R.-J., 1182, 1212
Chitinase, disease control by, from cloned DNA in *Escherichia coli*, 1246
Chiu, R. J., 235
Chiykowski, L. N., 1137
Chng, C. G., 1149
Cho, B.-H., 275
Cho, J. J., 1194
Choi, C. W., 1157
Choi, G. H., 1204
Chong, C., 1154
Chong, N., 1165
Chou, C. K. S., 1142
Chrysanthemum morifolium
—manganese toxicity, 1149
—marble cultivars, manganese toxicity, 1148
Chun, W., 1155, 1156
Chun, W. W. C., 311
Chung, Y. R., 1152
Cicer arientinum, wilt and root rot from, soil moisture effect, 1147
Cichorium endivia, escarole necrosis, incidence in Florida, 1194
Circulifer tenellus, vector for virescence, polyclonal antisera production, 1138
Citrus
—bacterial spot epidemics, spatial analysis in Florida, 1162
—canker: disease progress in Argentina, analysis, 1276; histopathology, strain comparisons, 329, (330-334); isozyme analysis, 297; serological identification of isolates, 780; ultrastructure and strain comparison, 336, (337-347)
—carbohydrate status in seedlings, *Fusarium solani* and naphthoquinone effects, 700
—greening disease: antiserum for detection, 1212; bacterial association, fastidious prokaryote, 382, (383); bacterium associated, in South Africa, 1182; epidemic analysis in China and French Reunion Island, 687
—photosynthesis in, role of phosphorus and *Glomus intraradices*, 1200
—Phytophthora root rot, sodium tetrathiocarbonate for, 1136
—replant problems of, factors in Texas, 1193
—Rhizosphere soil of, *Fusarium* effect on *Phytophthora* spp., 1223
—root and collar rot, phytoalexin and fungicide relation, 736
—root pathogens, rubidium-86 uptake, 1146
—stubborn disease spiroplasma, monoclonal antibodies for identification, 880
Citrus tristeza virus
—citrus infectious variegation virus compared to, growth and morphogenesis in tissue culture, 820, (822, 823, 825)
—epitope diversity in isolates, 1174
Civerolo, E. L., 297, 329, 793
Cladosporium caryigenum, on pecan, cytochemical response procedures, 1154
Claflin, L. E., 1191
Clark, C. A., 1197
Clark, E. M., 1177
Clark, E., 1141, 1191
Clark, R. L., 1160
Clavibacter spp., xylem limiting, on bermudagrass and bluegrass, chemical control, 1190
—*C. michiganense*: DNA binding, uptake, and degradation, 911; identification, specific using DNA-hybridization probes, 1019; on tomato, specific detection, homologous DNA probe use, 311; on tomato somaclone progeny, resistance, 1167
—*C. xyli*, on sugarcane, colloidal gold/pro-

tein A immunoblot assay, 1168
Claviceps fusiformis, on pearl millet, resistance, 1323
Clayton, M. K., 1162
Clemente, T. E., 372
Cleveland, T. E., 1192, 1208
Cline, W. O., 535
Clinton, W. P., 1141
Cloud, G. L., 1148
Clover
—arrowleaf, bean yellow mosaic virus on, tolerance, 230
—ladino, tall fescue association, ozone effect on, water stress, 128
—red, root rot from *Fusarium* and *Pseudomonas*, interaction, 436, (437, 438)
—subterranean: *Cercospora* on, seed production and quality effect, 209; *Cercospora zebrina* on, inoculation method, 1202; red leaf-like luteovirus in phloem of, 1197
Cobb, Jr., F. W., 1144, 1164
Cochliobolus spp.
—*C. heterostrophus*: chromosome rearrangement, electrophoretic confirmation, 1204; restriction fragment length polymorphism map, 1173
—*C. sativus*, in soil, tillage and crop rotation effect, 1005
Coffee, American leaf spot of, magnesium oxalate crystals in lesions, 783, (784, 785)
Coffey, M. D., 76, 761, 1079
Coghlan, M. J., 1170
Cohen, S., 109
Cohen, Y., 832
Coker, M. E., 1183
Colbaugh, P. F., 1168
Colbert, S. F., 1194
Coleman, P. M., 1194
Colletotrichum spp.
—*C. coccodes*, on tomato, infection factors in fruit, 1063
—*C. gloeosporioides*: on mango, benomyl tolerance, 1184; subspecies, heterokaryosis among, 1208; transformation, 1173
—*C. graminicola*: β-tubulin genes, analysis, 1172; conidial development, 1200; corn synthetics resistant to, 166; isolate characterization, gel electrophoresis of proteins, 1148; protoplast transformation, cloning the *PYRI* gene, 1204
—*C. lagenarium*: on cucumber, resistance induced by phosphates, 176; on cucurbits, histochemistry and ultrastructure of resistance, 1208
—*C. trifolii*, on alfalfa, virulence of races, 750
Collins, J. K., 1196
Collmer, A., 1210, 1211
Colyer, P. D., 1146
Computer applications
—ASCOKEY, identification of ascomycete genera, 1203
—PRO, disease proportion assessment, 1135
—white mold management on snapbean, predictive model, 1219
Concelmo, D. E., 1187
Coniothyrium minitans, biocontrol of *Sclerotinia*, 1345
Conn, K. E., 1155
Connelly, J., 909
Conservation tillage
—barley and wheat infected with *Bipolaris* and *Fusarium*, infection differences, 1006
—wheat tan spot, role of primary inoculum, 873
Converse, R. H., 912
Conway, K. E., 375, 1159
Conway, W. S., 1203
Cook, R. J., 1159
Cooksey, D. A., 745, 1179
Cooperman, C. J., 1172
Coplin, D. L., 1185
Corn
—anthracnose and northern corn leaf blight of, reaction after recurring selection for stalk rot and corn borer resistance, 166
—*Aspergillus flavus* and aflatoxin, in North Dakota, 1005
—bacteria from roots of, protein profiles of, computer-aided analysis, 1191
—chitinase activity in kernels of, 1192
—ear rot fungi of, predisposition of late plants, 1180
—grain yield and disease-stress environment, recurrent selection, 1201
—gray leaf spot: hybrid performance and yield loss, 1176; resistance screening, 1183
—kernel infection with *Aspergillus*, 1142
—leaf blight, race T, sporulation factors, 800
—*Macrophomina phaseolina* in rhizosphere of, spatial pattern, 1119
—northern leaf blight: Hawaiian isolate, 1004; resistance genes, 1003; resistance, temperature and light effect, 631
—northern leaf blight and leaf freckles and wilt resistance, genetic analysis, 1185
—*Penicillium* spp. in storage, factors, 1101
—*Rhizoctonia solani* AG-2-2 on, crop losses, 934
—stalk rot, tillage and rotation effect, 1141
—stiff stalks, *Helminthosporium carbonum* race 1, 1147
—stunt disease spiroplasma, monoclonal antibodies for identification, 880
—sweet, northern leaf blight epidemic, analysis in Israel, 1243
Cornus florida (see also Dogwood), anthracnose, incidence in national park, 377
Correll, J. C., 1194
Corwin, B. S., 1167
Corynebacterium sepedonicum, on potato stem, population density, 946
Cotton
—*Alternaria macrospora* on, sporulation affected by environment and host, 263
—*Aspergillus flavus* on, virulence of strains, 808
—bacterial infection, phytoalexin biosynthesis in leaves, 1150
—crumple, dispersion characteristics of, in fields, 1219
—root-knot nematode and Fusarium wilt relation to yield, 640
—seedling disease: *Pseudomonas fluorescens* as antagonist, 1216; tillage practice effect, 504
Cottonwood (see also *Populus*), leaf rust of, somaclonal variation, partial resistance, 805
Cotty, P. J., 808, 1153, 1186, 1208
Courtney, M. L., 1209
Cowpea chlorotic mottle virus, on soybean, restricted translocation, 373
Cowpea mosaic virus, coat protein genes, transgenic tobacco production, 1158
Cox, E. L., 1162
Cox, J. R., 1195
Craft, C. M., 1009, 1147
Craig, J., 448
Craig, R., 367
Cramer, C. L., 1150, 1157, 1198
Cranberry
—fruit rot, temperature effect, 1154
—*Phialophora* and *Rhizoctonia* on, pathogenicity, 1154
Creamer, R., 942
Creemers, P., 1171
Criconemella xenoplax, hosts of, *Prunus* selections, 1193
Crill, J. P., 1161
Cronartium spp.
—*C. quercuum*: aeciospores, virulence of isolates, 1164; isozyme characterization with gel electrophoresis, 444; liquid nitrogen storage, 1209; on loblolly pine, spore composites, 1220; on pine, cell nuclear changes, 371; on slash pine, cellular changes, 1165
—*C. ribicola*, on alternate hosts, histopathology of infection, 539, (542-545)
Crosslin, J. M., 908, 911
Crowley, M., 372, 1140
Cryphonectria parasitica (see also *Endothia parasitica*)
—on chestnut, resistance induction, 1165
—hypovirulent strains: laccase activity in dsRNA, 219; in New Jersey, 1142
—protoplasts, cell-wall-free, 1143
Csinos, A. S., 1147
Cucumber
—anthracnose: *Cladosporium* relation, peroxidase, 1150; ethylene and silver thiosulfate effect, 1184; peroxidase relation, 1150; resistance induced by phosphates, 176
—damping-off, biocontrol with *Pseudomonas*, siderophore role, 911
—disease resistance, chemicals as inducers of, 1144
—hypersensitivity induced by bacteria, fatty acid change during paraquat treatment, 705
—powdery mildew, plant introductions resistant to, 1160
Cucumber mosaic virus
—cloning from dsRNA, 1250
—pH-mobility curve, 661
—on weeds near lettuce fields in New York, 65
Cucumis metuliferus, papaya ringspot virus on, nitrous-acid induced strains, 1257, (1258, 1260)
Cucurbit, geminiviruses of, detection using nucleic acid probe, 1123
Cucurbit leaf curl virus, in whiteflies, acquisition and retention, 109
Culbreath, A. K., 1146
Cullen, R. E., 374
Culver, J. N., 1157, 1195
Cummings Carlson, J., 1142
Cunfer, B. M., 1217
Cuppels, D. A., 1210
Custer, D., 1194
Cutinase, diversity in fungal pathogens, 1151
Cyamopsis tetragonoloba, viral disease of, new, 1188
Cylindrocladium crotalariae, inoculum density in soil, estimation, 1146
Czosnek, H., 562

Dactylis glomerata, resistance to winter stress, heritability, 1184
Dal Bó, E., 1309
Dalisay, R. F., 1150
Dalmacio, R., 1185
Dalrymple, L. W., 1212
Dam, R., 1145
Damann, K. E., Jr., 1168
Dandurand, L. M., 1223
Danehower, D. A., 1145
Dankers, W., 1190
D'Arcy, C. J., 869, 1003, 1197
Datnoff, L. E., 1190
Daub, M. E., 180, 213, 600, 1172, 1198
Davis, D. D., 1144, 1220
Davis, G. D., 1150
Davis, J. M., 1135
Davis, J. R., 1146

Davis, M. A., 1003
Davis, R. E., 880, 1137, 1209
Davis, R. M., 1161
Davis, W. E., 373
Dawson, W. O., 1157, 1195
Daykin, M. E., 535
Deahl, K. L., 1145
Dean, J. F. D., 1071
De Boer, S. H., 946
Deep, I. W., 1141
Défago, G., 584
DeFeyter, R., 1156
De Long, R. E., 1149
Denbow, C. J., 1198
Dendroctonus spp., on ponderosa pine, fungal associates in mixed inoculation, 768, (769, 770)
Denis, J. M., 1170, 1171
Denny, T. P., 1156, 1211
de Reffye, P., 913
Dery, P. D., 1217
Desjardins, A. E., 170
Desmodium yellow mottle virus, on *Apios americana*, with cucumber mosaic virus, 1197
Dessureault, M., 1165
Detweiler, R., 1153
DeVay, J. E., 1007
DeVit, M., 1204
De Vries-Paterson, R. M., 1167
de Zoeten, G. A., 1158
Di, R., 1139
Diaporthe phaseolorum, on soybean, phytotoxin production by, 499
Dichotomophthora portulacae, on purslane, weevil as vector to overcome water requirement, 1216
Dickinson, T. A., 1035
Dickman, M. B., 1145, 1172, 1173, 1186
Dictyosporium elegans, biocontrol of *Sclerotinia*, 1345
Diehl, S. V., 372, 1154
Dienelt, M. M., 329, 336, 1148, 1149
Dillard, H. R., 1063
Diplodia maydis, on corn, recurrent selection for resistance to, 166
Discula sp., on dogwood, conidial germination, factors, 1203
Disease detection
—leaf spot of peanut, radiometer application, 958
—plasmid DNA probe, bacterial blight of bean, 518
Disease diagnosis, halo blight of bean, DNA probe, 903
Disease forecasting
—apple scab, Mills's criteria revised, 304
—black rot of apple, temperature and wetness duration, 440
Disease loss assessment, sorghum downy mildew, use of near-isogenic populations, 448
Disease prediction, mesoscale weather forecasting technique, applications, 1219
Disease-stress environment, plant yield, selection theory, 70
Dittapongpitch, V., 1192
Dixon, R. A., 1199
DNA, from *Escherichia coli*, clones, chitinase and disease control, 1246
DNA probe, *Clavibacter michiganense* detected by, in tomato, 311
Dodds, J. A., 1123
Dogwood (see also *Cornus florida*)
—anthracnose epidemiology, in Tennessee, 1149
—canker, histological comparison, 377
Dogwood mosaic virus, on *Cornus florida*, characterization, 951, (953, 954)
Donahue, P. J., 1176, 1368
Donald, P. A., 1212
Donaldson, R., 372, 1140
Donegan, K., 1176
Doney, J. C., Jr., 1153
Dori, S., 1136
Doster, M. A., 590
Dougherty, W. G., 1158
Douglas-fir, Armillaria root rot, growth reduction from infection, 482
Dowler, W. M., 474
Dozier, W. A., Jr., 1155
Dreisbach, T., 1143
Duffus, J. E., 109, 1158, 1161, 1214
Dunbar, K. B., 1190
Duncan, K. E., 1205
Duncan, R. A., 908
Dunckelman, J. W., 1184
Duniway, J. M., 1180
Duran-Vila, N., 820
Durand, D. P., 1261
Dyer, A. T., 1165
Dysmococcus brevipes and *D. neobrevipes*, mealybug wilt vector on pineapple, 1341

Easton, G. D., 1152
Eav, B. B., 1142
Ebesu, R. H., 1341
Echandi, E., 819, 1152
Echinochloa ragged stunt virus, rice ragged stunt virus compared to morphologically, 235, (236-239)
Eckert, J. W., 1196
Edelson, J. V., 1162
Eiland, B. R., 1202
Eisenback, J. D., 1208
Elazegui, F. A., 1137
Elgin, J. H., Jr., 750
Elissalde, M., 1145
Ellerbrock, L. A., 1194
Ellingboe, A. H., 143
Elliott, C. K., 773
Elliott, M. L., 1177
Ellis, D. E., 819
Ellis, M. A., 425, 1154, 1163, 1219
Ellis, P. J., 908
Elmer, W. H., 88
Endocronartium harknessii, on jack pine, silvicultural significance, 1165
Endophyte, on grasses, alkaloids of, insecticidal activity, 1144
Endothia parasitica (see also *Cryphonectria parasitica*)
—metabolite from, ethylene production in trees, 1221
—mitochondrial plasmids, 1171
Engelhard, A. W., 1168
Engelkes, C. A., 1167
Engle, J. L., 1149
English, H., 1007
English, J. T., 395
Enterobacter cloacae, enzymes of, carbohydrate degrading, 1215
Epidemics, raindrop impact and splash dispersal, study method, 1219
Epidemiology
—*Phytophthora cactorum* splash dispersal, in strawberry canopy, 425
—spatial patterns, African cassava mosaic virus, 913
Epimedium × *youngianum*, ringspot and oakleaf pattern, tobamovirus association, 1180
Epstein, A. H., 1006, 1139
Epstein, L., 1164, 1194, 1208
Erb, W. A., 1176
Errampalli, D., 1137
Errata
—vol. 78, no. 12: part 1, 1988, 504; part 2, 1988, 378
—vol. 79: no. 1, 1989, 378; no. 5, 1989, 818; no. 10, 1989, 1390
Erwin, D. C., 1202
Erwinia spp.: capsular polysaccharide synthesis, regulation, 1185; extracellular enzyme production, cloning of genes, 1155
—*E. amylovora*: extracellular polysaccharide production, characterization of gene, 1156; *HRP* gene cluster, cloning and characterization, 1211; monoclonal antibodies for, detection by ELISA, 610; pathogenicity genes, hypersensitive response elicited by *Escherichia*, 1156; on pear, fungicide and antibiotic resistance, 909
—*E. carotovora*: catechol siderophore production, 1155; enzymes, proteins from potato cell walls, 1181; extracellular protease of, characterization, 1200; genetically altered strains in soil, survival, 1168; pectin lyase production, regulation by DNA damaging agents, 1155; on tomato, survival on leaves, 1187
—*E. chrysanthemi*: cell degradation in plants by pectate lyase and xylanase, 1198; mutants, multiple pectic enzymes deficiency, analysis, 1210; pectate lyase gene from, molecular cloning, 1211
—*E. herbicola*: biocontrol for *Fusarium* and leaf rust, 990; IAA production, molecular basis, 1177
—*E. graminis*: tubulin gene from, molecular characterization, 1205; on wheat, disease assessment and yield loss, 462; on wheat, epidemiology, 374; on wheat, triadimenol effect, 374; on wheat, triadimenol seed and foliar treatments, 152; on wheat and barley, novel foliar fungicide for, 1170
Escande, A., 1152
Escherichia coli, DNA of, plant disease control by chitinase from, 1246
Essenberg, M., 1150
Evans, R. C., 1004, 1151
Evans, T. A., 253
Eversmeyer, M. G., 1217
Exserohilum turcicum
—on corn: synthetics resistant to, 166; virulence, temperature and light effects, 631
—on sweet corn, epidemic analysis in Israel, 1243
Eyal, Z., 1183

Facteau, T. J., 1154
Faghihi, J., 927
Falk, B. W., 908, 942
Falk, S. P., 318
Falkenstein, K. F., 470
Fang, G., 1194
Fang, J. G., 1159
Fannin, N., 1144
Fargette, D., 913
Farias, G. M., 1146
Farrald, C., 1193
Farrand, S. K., 1178
Fauquet, C., 913
Feliciano, A. J., 1171, 1183
Feng, G. H., 1006
Fenn, M. E., 76
Fernandes, F. I., 1189
Fernandez, J. A., 909
Ferrandino, F. J., 146, 1229
Ferrell, G. T., 1164
Ferris, J. M., 927
Ferris, M. A., 579
Ferris, V. R., 927
Ferriss, R. S., 267, 1135, 1223
Fertilizer, phosphate, anthracnose on cucumber affected by, 176
Fescue, endophyte infection, nematode reproduction, 374
Fetch, T. G., Jr., 1201
Filer, T. H., Jr., 372

Filonow, A. B., 372, 374, 1192
Fir, white, *Heterobasidion annosum* on, host specialization, 290
Fisher, G. A., 1138
Fletcher, J., 1137, 1205
Fong, R. A., 1193
Foor, C. J., 1159
Ford, C., 1173
Ford, E. J., 1176
Ford, R. E., 223
Forster, R. L., 1168
Fouly, H. M., 1003, 1197
Fourrest, E., 1181
Fouse, D. C., 1171
Fox, R. D., 1219
Fraedrich, S. W., 1109, 1114, 1165
Franckowiak, J. D., 1207
Frankiowiak, J. D., 1201
Fraser, J. D., 1138, 1206
Frederiksen, R. A., 1218
Freeman, S., 1054, 1160
French, D. W., 1221
French, R., 1158
French, R. C., 1198
French, W. J., 1206
Frisina, T. A., 1193
Fry, W. E., 511, 590, 1145
Fulbright, D. W., 568, 861, 1171
Fulton, R. H., 1137
Fumigation, in conifer seedling nurseries, for soilborne pathogens, 909
Fungicides (general) (see also Fungicides, specific)
—combination sprays, for roses, 1168
—granule technology, water-dispersible, 1170
—leaf wetness sensor, cylindrical impedance, use and manufacture, 1177
—methionine riboflavin mixture, biocidal reaction, photodynamic, 1170
—resistance to: in *Phytophthora* spp., 76; stochastic model for pathogen populations, 1163
—take-all patch control, 1169
Fungicides (specific) (see also Fungicides, general)
—cyproconazole: for peanut pathogens, new systemic, 1170; new systemic for turf diseases, 1168
—ferimzone, for rice blast, mode of action, 827
—flutolanil, for rice sheath blight control, 1091
—fosetyl-Al, citrus resistance to *Phytophthora*, relation, 736
—metalaxyl: *Phytophthora infestans* populations resistant to, effect on sporangia, 832; *Rhizoctonia* and *Sclerotium* affected by, 374
—penconazole and propiconazole, effect on ultrastructure of *Pythium* and *Phymatotrichum*, 1170
—phosphite, *Phytophthora* spp. affected by, mode of action, 921
—phosphonate, fosetyl-Al, mode of action, 76
—phosphonate compounds, *Phytophthora* spp. affected by, comparison, 761
—propiconazole, for stem rust on *Lolium perenne*, 912
—Thiram, on apple, pear, and strawberry, combinations, 1171
—triadimenol, seed and foliar treatments for powdery mildew, 152
Furumi, K., 162
Furusawa, I., 827
Fusarium spp.: detection using novel enzyme immunoassays, 162; nitrogen metabolism regulation, *Neurospora* gene, 1172; rhizosphere competency, on corn, 1166; toxicity and toxin production, Chinese isolates, 1186
—*F. avenaceum*, on red clover, interaction with *Pseudomonas*, 436, (437, 438)
—*F. crookwellense*, from potato, grain, and pasture herbage, mycotoxins from, 1196
—*F. culmorum*, on wheat, biocontrol with *Erwinia herbicola*, 990
—*F. graminearum*, on grain sorghum, herbicide and pH effect, 1003
—*F. moniliforme*: perithecial pigmentation, nuclear gene for, 1003; on sorghum, inoculum density and root development, 1193; transformed strains of, hygromycin resistance heritability, 1186
—*F. nygamai*, from millet seed, toxicity to ducklings in Nigeria, 1187
—*F. oxysporum*: on asparagus, vegetative compatibility groups, classification, 88; on asparagus, virus predisposed infection, 253; on cotton, mortality and yield effect, 640; crop residue colonized by, pathogenic and nonpathogenic strains, 1161; heat shock protein synthesis in, 1054; on muskmelon, root colonization, 1095; propagules weakened by sublethal heating, protein synthesis, 1160; protoplasts from, isolation and fusion, 1204; in rhizospheres, competition role with *Trichoderma*, 198; on soybean seeds, detection, 1006; in suppressive soil, ecology, 1166; survival in soil, cropping system effect, 1166; on watermelon, local and systemic resistance, 856; on watermelon, monoculture, 374
—*F. oxysporum* f. sp. *cucumerinum*, enzyme immunoassays for detection, 162
—*F. solani*: *EIN* gene, cloning and characterization, 1204; on rough lemon seedlings, carbohydrate status, naphthoquinone effect, 700; on soybean, sudden death syndrome relation, 191, (193-195); on soybean, virulent isolates, 1136; T-2 toxin produced by, relation to soybean sudden death, 1167; transformation with plasmid DNA by electroporation, 844
—*F. sporotrichioides*, on parsnip, trichothecene and furanocoumarin role, 170

Gabriel, D. W., 1156, 1211
Gadoury, D. M., 304, 1163
Gaeumannomyces spp., selective medium for isolation, 1177
—*G. graminis*: siderophore of, characterization, 1136; on wheat, pseudomonads suppressive to, antibiosis role, 143
Gafni, Y., 1177
Gallenberg, D. J., 1194, 1207
Galvez, G., 1179
Gamble, H. R., 1071
Garber, R. K., 372
Garcia-Espinosa, R., 1167
Garibaldi, A., 1176
Garnett, H. M., 382
Garnsey, S. M., 1174
Garraway, M. O., 800, 1004, 1151
Gates, R. N., 1180
Gavin, A. M., 1212
Gbur, E. E., 1219
Ge, X., 1157, 1195
Gees, R., 1079
Geotrichum candidum
—on onion, bulb rot in Texas, 375
—tubulin encoding, cloning and sequence analysis, 1204
Gera, A., 258
Geranium
—bacterial blight, seedling resistance, 1190
—*Botrytis cinerea* on, spore concentration, 1149
—rust controlled by *Bacillus subtilis*, 367
—viruses of, detection using dsRNA analysis, 1197
Gergerich, R. C., 376, 1215
Gerik, J. S., 1161, 1223
Gerlach, W. L., 1215
German, S., 1216
German, T. L., 1194, 1337, 1341
Germ plasm collections, small fruit, USDA virus status, 1196
Ghabrial, S. A., 1158
Ghiringhelli, P. D., 1309
Gholson, R. K., 1199
Gibberella spp.
—*G. pulicaris*, transformants, sequence identification, 1172
—*G. thapsina*, on sorghum, seedling blight from, 1193
—*G. zeae*, deoxynivalenol role in pathogenesis, protoplast fusions, 404
Gilbert, R. G., 1136
Gilbertson, R. L., 518
Gilchrist, D. G., 1141
Gillaspie, A. G., Jr., 372
Gillespie, T. J., 1177
Gingery, R. E., 1157, 1189, 1195
Ginzburg, C., 1054, 1160
Gitaitis, R. D., 373, 1181
Glawe, D. A., 1005
Gleditsia triacanthos, Thyronectria canker of, water stress, 1333
Gliocladium spp., in soil, selective isolation, 1209
—*G. virens*: biocontrol agent compatible with chemicals, 1152; biocontrol agent for *Pythium* and *Rhizoctonia*, 361; *Pythium* and *Rhizoctonia* growth affected by, bioassay, 1177
Glomerella cingulata, DNA elements from, conserved repetitive, 1173
Glomus etunicatum, sporulation and root colonization, phosphorus effect, 374
Godoy, G., 1145
Gold, S. E., 1204
Goldberg, K-B., 1158
Golino, D. A., 1138
Gomphrena globosa, Alternaria leaf spot of, 1149
Gonsalves, D., 357, 1189
Gonzalez, C. F., 322, 984, 1210, 1390
Gonzalez, D., 1147, 1186
Goodman, R. N., 1156
Goodrick, B. J., 373
Gorbet, D. W., 1179
Gordon, D. T., 113, 1157, 1195
Gordon, T. R., 1095, 1146, 1161
Gotlieb, A. R., 1222
Gottstein, H. D., 176
Gottwald, T. R., 780, 1162, 1182, 1276
Gould, A. B., 1137, 1203, 1206
Graham, E., 377
Graham, J. H., 745, 1162, 1182
Graham, M. Y., 1150
Graham, T. L., 1150, 1199
Grand, L. F., 1138
Grant, B. R., 417, 921
Grape
—Botrytis bunch rot, microclimate effect, 395
—*Botrytis cinerea* and berry moth larval association, 651, (652-655)
—diseases and pests, leaf removal for management, 1137
—leafroll disease, closterovirus association: monoclonal antibodies for study, 1189; ultrastructure and mitochondrial vesiculation, 357, (358, 359)
—powdery mildew, mean generation time, 908
—SO_2 fumigation for, residues, 1171

Grasses, ergot, blind seed, and seed gall nematode on, distribution in Oregon, 1202
Grau, O., 1309
Graves, C. H., Jr., 372, 373, 1139, 1154, 1167, 1182
Graves, W. R., 1213
Gray, F. A., 909
Gray, L. E, 1172
Gray, S. M., 1148, 1174
Grayson, R. L., 156, 1195
Green, F., III, 1220
Greenough, D. R., 373
Gremmeniella abietina
—on red pine, low temperature effect and conducive day concept, 1293
—spore production and inoculation techniques, 1290
Griffin, D. E., 373, 1167, 1182
Griffin, D. H., 315, 318, 1204
Griffin, G. D., 909
Griffin, G. J., 1146
Grisham, M. P., 373, 1184, 1218
Gross, D. C., 1178
Gross, K. C., 1203
Groth, J. V., 409, 1208, 1209
Grothaus, G. D., 1139
Groves, P., 1161
Grumet, R., 1194
Gubler, W. D., 395, 1154, 1155
Gudauskas, R. T., 1171
Guest, D., 921
Guillemette, M. K., 246
Gullino, M. L., 1176
Gumpert, F.-M., 968
Gunasinghe, U. B., 1337, 1341
Gunnell, P. S., 1154
Guo, A., 433, 573, 1004
Guo, L. Y., 1205
Guthrie, W. D., 166
Gutterson, N., 1160
Gwinn, K. D., 374, 1144, 1212

Hadden, K. C., 373
Hadidi, A., 1174, 1175
Hadwiger, L. A., 1184, 1207
Haefele, D., 1191
Hagan, A. K., 1139, 1169, 1171
Hagedorn, C., 1216
Hagedorn, D. J., 518
Halbert, S., 909
Halbrent, J. M., 1174
Hall, H. R., 1170
Hall, R. B., 1004
Hall, T. J., 373
Hallauer, A. R., 1147
Hamada, H., 1150
Hamm, P. B., 909
Hammar, S., 568
Hammerschmidt, R., 1190, 1208
Hammond, J., 1174
Han, Y., 1221
Hanau, R. M., 1172, 1200, 1204
Hancock, J. F., 488
Hanlin, R. T., 1145, 1203
Hanna, W. W., 1180
Hansen, E. M., 909, 910
Harlap, S., 258
Harman, G. E., 1159, 1172
Harmon, G. L., 1199
Harrington, T. C., 290, 1185, 1220
Harris, C. M., 1171
Harris, K. F., 1157
Harrison, G. W., 371
Hart, E. R., 1004
Hart, L. P., 404
Hartel, P. G., 1223
Hartnett, D. C., 1217
Hartsell, P. L., 1171
Hartung, J. S., 297, 793
Harvey, J. M., 1171
Hattermann, D. R., 284
Hausbeck, M. K., 1149
Hayashi, Y., 728
Haygood, R. A., 371, 373
Hayman, G. T., 1178
He, S. Y., 1210
Heagle, A. S., 128
Hebard, F. V., 1165, 1221
Heck, W. W., 128
Hedin, P. A., 372, 1154
Hegwood, C. P., Jr., 373
Heide, M., 1019, 1066
Heidel, G. B., 1197
Heiniger, U., 219
Helgeson, J. P., 1375
Hemmat, M., 1172
Hemphill, D. D., Jr., 910
Hendrick, C., 1191
Hendrix, F. F., Jr., 1154, 1193
Henis, Y., 1160
Henkels, M. D., 909
Hennessey, M. T., 1220
Hensley, D., 374
Henson, D. J., 1171, 1215
Hepburn, A., 1172
Herr, L. J., 1004, 1160
Hershman, D. E., 1141
Hertsgaard, D. M., 1358
Heterobasidion annosum
—host specialization, isolate compatibility, 290
—isolates from Europe, allozyme, 1144
—in red pine-white pine, clone delineation, 1220
—'S' and 'P' groups, interfertility in North America, 1164
—virulence of isolates, 1164
Heterodera spp.
—*H. avenae*, on cereal, protein patterns, two-dimensional, 927
—*H. glycines*: hybridization with *H. cruciferae*, morphology, 1183; reproduction of, fungus effect, 1005; on soybean, sudden death syndrome relation, 191, (193-195)
Heuchelin, S. A., 1004
Heun, M., 1201
Hewings, A. D., 470
Hibiscus chlorotic ringspot virus, pH-mobility curve, 661
Hickman, M. J., 1208
Hiebert, E., 1213
Highley, T. L., 1220
Higley, P. M., 1140
Hill, J. H., 1139, 1261
Hill, R. R., Jr., 436
Hirooka, T., 1091
Hiruki, C., 1137, 1215, 1253
Ho, M.-Y., 1215
Hobbs, H. A., 374
Hobolth, L., 1066
Hodge, N. C., 376
Hodges, H. H., 191
Hoelmer, K. A., 1161
Hohl, H. R., 219
Hohn, T., 1158
Hoitink, H. A. J., 1152
Holley, R. C., 1358
Homalodisca coagulata, phony peach disease vector, feeding preference and amino acids, in xylem, 1206
Hooker, W. H., 1008
Hooper, G. R., 156
Hopkins, D. L., 374, 1166
Hopkins, M. S., 372
Horstman, M. J., 1202
Hotchkiss, M. W., 1193
Howard, C. M., 1136
Howard, K. M., 1169
Howell, A., 1202
Howie, W., 1160
Hoy, J. W., 1185, 1218
Hrabak, E. M., 1178
Hsu, H. T., 235, 1197, 1209
Hu, J. S., 1189
Huang, J. W., 1220
Huang, Y., 1178
Hubbard, J. C., 1223
Huber, D. M., 1148, 1166, 1180
Hudelson, B. D., 1162
Huerta-Espino, J., 1218
Huff, G. E., 1144
Hughes, K., 1148
Hughes, M. E., 1218
Hulbert, S. H., 888
Hulse, M. M., 1005
Hunger, R. M., 1003, 1004
Hunt, A. G., 1214
Hunt, V. L., 1162
Hunter, J. E., 1181
Hussey, R. S., 1139
Hutcheson, S. W., 1208, 1211
Hwang, I., 1210
Hyakumachi, M., 1059
Hypersensitivity
—alfalfa and tobacco, bacterium-induced, cellular response, 1208
—*Pseudomonas syringae* to cucumber, role of membrane lipid fatty acids, 705
—in tobacco cell suspensions, bacterium induced, lipid peroxidation, 555
Hypoxylon mammatum
—on aspen, moisture stress effect in tissue culture, 315, (316), 318
—host range and pathogenicity, 1221
—protoplast formation and transformation, 1204

Ichida, J. M., 1004
Iles, A., 1140
Illman, B. L., 1211
Ilott, T. W., 888
Imanaka, W., 322
Ingham, R. E., 910, 911
Inonotus tomentosus, population genetics of, vegetative compatability, protein, 910
Integrated pest management, BLIGHT-ALERT, for Botrytis leaf blight of onion, fungicide applications, 493
Ireholm, A., 927
Ireland, K. F., 1161
Iris, rust, fungicidal control, 1168
Iris severe mosaic virus, serological nonidentity, mosaic strain, 1175
Ishimaru, C. A., 909, 911, 1155
Isozyme analysis
—*Phytophthora* spp., four species, 773
—*Tilletia indica* teliospores identified by, 596
—*Xanthomonas* on citrus, 297
Isozymes, direction on polyacrylamide electrophoresis and isoelectrofocusing gels, 1200
Ivanovich, A. J., 1136

Jackson, A. O., 1174
Jackson, D. P., 1210
Jackson, K. E., 1006, 1206
Jacobi, J. C., 1203
Jacobi, V., 1173
Jacobi, W. R., 1333
Jacobs, J. L., 1184
Jacobson, D. J., 1095, 1146
Jang, J. C., 1143, 1221
Janisiewicz, W., 1187, 1216
Jardine, D. J., 1003, 1193
Jeffers, S. N., 1164
Jeger, M. J., 1195, 1318
Jelkmann, W., 1250
Jenns, A. E., 213, 600

Jensen, C. J. P., 1175
Jensen, S. G., 1004, 1215
Jiang, D., 1198
Jilka, J., 223
Jimenez, M. J., 1194
Jin, Y., 1207, 1213
Joaquim, T. R., 1176
Jochimsen, K. N., 1182
Johansen, I. E., 1019
Johanson, A., 1195
Johnson, D. A., 909, 1202
Johnson, D. R., 1187, 1209
Johnson, E. L. V., 1138, 1146
Johnson, G. A., 1222
Jones, A. L., 861, 1153, 1179
Jones, E. R., 1202
Jones, G. S., 1141
Jones, J. B., 1168, 1178
Jones, J. P., 1161
Jones, K., 1183
Jones, O. R., 1141
Jones, R. K., 984
Jones, R. W., 1174
Jones, T. L., 1212
Jones, W. F., 1192
Jordan, R. L., 880, 1157, 1213
Jourdain, E. L., 376
Juzwik, J., 1165

Kabatiella zeae, inoculum of, stromatic, 1192
Kadish, D., 832
Kahr, G., 584
Kano, T., 1174
Kardin, M. K., 409
Karr, A., 911, 1166, 1180
Karu, A., 1178
Kashman, Y., 1136
Katan, J., 1054, 1160
Katsanos, R. A., 1141
Katz, B. H., 995
Kaul, K., 391
Kawalek, M. D., 909, 912, 1182, 1211, 1215
Kazimir, J. E., 909
Keel, C., 584
Keeling, B. L., 1175
Keen, N. T., 1144, 1179, 1204
Kelemu, S., 1178
Keller, P., 1167
Kelley, J. G. W., 1219
Kelley, K. M., 1137
Kelley, V. C., 1188
Kelley, W. D., 1142, 1221
Kelman, A., 1181, 1374
Kempf, H.-J., 990
Kendall, W. A., 436
Kendig, S. R., 1179
Kennedy, C. J., 1178
Kenneth, R., 1176
Keppler, L. D., 555, 974, 1208
Keyser, G. C., 61
Khan, R. A., 1202
Khan, V. A., 1177
Kiernan, J. M., 1158
Killebrew, J. F., 191
Kim, D. H., 910
Kim, H. M., 1140
Kim, K.-C., 275
Kim, K. K., 1177
Kim, K. S., 357, 1215
Kim, S. H., 1167
Kim, Y.-C., 275
Kimmons, C. A., 374
King, S. B., 1323, 1390
Kingsland, G., 374
Kingsley, M. T., 1156, 1211
Kinkel, L. L., 1162
Kirby, H. W., 1148
Kirkpatrick, B. C., 1138, 1206
Kistler, H. C., 1204
Kitagawa, T., 162
Kiwifruit
—Phytophthora root and crown rot, flood duration effect in California, 1155
—Pythium root rot, 1155
Klee, H. J., 1145
Klein, R. E., 1213
Klich, M. A., 1212
Klomparens, K. L., 488, 1173, 1208
Klopfenstein, N. B., 1004
Klopmeyer, M., 1139
Knievel, D. P., 1144
Knoke, J. K., 1188
Knorr, D. A., 1195
Ko, W. H., 1205
Kobayashi, D., 1144, 1178
Koch, E., 1207
Koch, M. F., 1200
Koenraadt, H., 1153
Koizumi, M., 1174
Köller, W., 278, 1151, 1170, 1171
Kolmer, J. A., 349, 525, 1185, 1216, 1313
Kommedahl, T., 1166
Konai, M., 880
Koons, K., 1272
Korhonen, K., 1144
Korjagin, V., 1139
Kosuge, T., 911
Kotcon, J. B., 1153
Kousik, C. S., 1212
Kraft, J. M., 908, 1147
Kramer, C. L., 1217
Kranz, J., 263
Kraus, J., 910
Krause, C. R., 1004
Krumkalns, E. V., 1170
Krupinsky, J. M., 413
Kubicek, Q. B., 297
Kúc, J. A., 176, 267, 271, 979, 1024, 1144, 1150, 1151, 1152, 1199, 1200
Kucharek, T. A., 374
Kuhlman, E. G., 1164, 1220
Kuhn, C. W., 373, 375, 814, 1213
Kulik, M. M., 1217
Kunoh, H., 1091
Kuske, C. R., 1138, 1206
Kyostio, S., 1200

Laakso, M., 1189
Labrinos, J. L., 837
Laby, R. J., 1156, 1211
Laccaria spp., on black spruce, incompatibility factors and mating competence, 694
Lacy, G. H., 1168, 1190, 1200
Lacy, G. L., 1150
Lacy, M. L., 1161
Lakshman, D. K., 1195
Lalitha, B., 499
Lamari, L., 740
Lamb, C. J., 1199
Lamkey, K. R., 1147
Land, D. H., 1142, 1221
Landon, K., 377
Lange, L., 1066
Langenberg, W. G., 1265
Langham, M. A. C., 223
Lankow, R. K., 1139
Larkin, R. P., 374, 1166
Larsen, M. J., 1220
Larson, P. R., 1170
Lasiodiplodia theobromae, on slash pine, cone harvesting practice effect, 1165
Latch, G. C. M., 1144
Latham, A. J., 1155
Latham, C. J., 999
Latin, R. X., 1206
Lavermicocca, P., 185
Law, M. D., 757, 1157
Lawn, D. A., 1142
Lawrence, G. W., 191, 1192, 1193
Lawson, R. H., 329, 336, 1148, 1149, 1197
Lazzari, F. A., 1140, 1196
Leach, J. E., 433, 573, 984, 1004, 1006, 1136, 1178
Leary, J. V., 311, 1177
Lease, R. J., 1207
Leath, K. T., 436, 1144
Leath, S., 152, 371, 1142, 1201, 1202
Leavitt, G. M., 1137, 1169
LeCoustre, R., 913
Lee, F. N., 1141
Lee, I.-M., 880, 1137, 1209
Lee, J. W., 1146
Lee, K. W., 357
Lee, M. H., 1170
Legard, D. E., 1181
Legendre, B. L., 1184
Legge, N., 417
Lehto, K. M., 1195
Lei, J., 1165
Leiner, R. H., 1180
Lemin, R. C., Jr., 1220
Leong, S. A., 518, 1005
Leopold, D. J., 1221
Leptographium spp.
—*L. procerum*, on Christmas tree plantations, root feeding insects, 1220
—*L. terebrantis*, on ponderosa pine, mixed inoculations, 768
—*L. wageneri*, heterokaryosis and vegetative compatibility, 1185
Leptosphaeria maculans, on *Brassica*, pathogenicity grouping, 1207
Leptosphaerulina spp., on alfalfa and white clover
—severity and epidemic components, 375
—spatiotemporal models for epidemics, 1163
Leslie, J. F., 1003, 1172, 1186
Letters to editor
—genes for sunflower rust races, 1232
—plant damage effect on crop yield, distribution-free method for estimation, 1229
Lettuce
—corky root: bacterial cause from muck soils, 1182; disease losses, 910; resistance comparison in Florida, 1190
—downy mildew of, gene-for-gene analysis, 888
Leucostoma sp.: hypovirulence, viruslike particle association, 1175; phytotoxin from cultures of, characterization, 1154
—*L. persoonii*: dsRNA of, low virulence association, 568; on peach, wounding and cultivar variation effect, 627
Leung, H., 1136, 1185
Levine, R. G., 436
Levy, Y., 832, 1243
Lewis, D. H., 1176
Lewis, J. A., 1160
Lewis, K. J., 910
Lewis, P. I., 374
Lewosz, J., 1181
Li, H., 1186
Li, H.-L., 1390
Liao, C.-H., 1199
Liddell, C. M., 1159, 1327
Liebman, J. A., 1194, 1216
Lightfoot, R. T., 1210
Liliental, J., 911
Lim, G., 1149
Lim, P. O., 1206
Lim, S. M., 877, 1202, 1203, 1210
Linde, D. C., 1209
Lindow, S. E., 619, 1085, 1162, 1191
Line, R. F., 1207, 1222
Lippert, R. M., 373
Lipps, P. E., 462, 1141, 1216
Lister, R., 909
Lister, R. M., 1174, 1213, 1214, 1348, 1353
Liu, H., 1146

Liu, H. Y., 109
Liu, L. J., 1207
Liu, Z., 1205
Liyanage, H. D., 374, 1138
Lizardi, E., 1207
Lobesia botrana, on grape, *Botrytis cinerea* association, 651, (652-655)
Lobinske, R. J., 374
Locke, J. C., 361, 1152
Lockhart, B. E., 1158
Lockwood, J. L., 1059
Loebenstein, G., 258
Lommel, S. A., 457, 1194, 1195
Long, D. L., 525, 1218
Longhurst, C., 1170
Loper, J. E., 909, 910, 911, 912, 1155, 1215
Lorbeer, J. W., 65, 301, 493, 1194
Louie, R., 1188
Luciano, A., 474
Ludy, R. L., 910
Luisetti, J., 1191
Lukacsko, T. P., 1149
Lukezic, F. L., 367, 436
Luley, C. J., 1013
Lumsden, R. D., 361, 1152, 1160, 1177
Luthe, D. S., 1139
Lyda, S. D., 1170
Lynch, T., 488
Lytle, F. E., 1148

Ma, S.-W., 1210
Maas, J. L., 1203
MacDonald, J. D., 912
MacDonald, S. G., 910
MacDonald, W. L., 1143
Mace, M. E., 1145
MacFall, J. S., 1221
MacHardy, W. E., 304
Mackey, B. E., 401
Mackill, D. J., 1184
Macol, L. A., 1211
Macrophomina phaseolina
—in corn, spatial pattern in rhizosphere, 1119
—microsclerotia of, irrigation effect on population and soybean yield, 1179
—propagule density, determination using resource allocation, 372
—on soybean, bioassays for resistance, 1180
—spatio-temporal analysis, 848
—thermal inactivation in soil, 375
—toxic compounds from, 1166
Madariaga, R. B., 1141
Madden, L. V., 425, 462, 1154, 1163, 1219
Madi, L., 1160
Magarey, R. C., 1302, 1306
Maggio, R. C., 1318
Magnaporthe grisea, DNA segments, occurrence, 1005
Mahanti, N., 1171
Mahoney, N., 1187
Maia, L. C., 1222
Main, C. E., 606, 865, 1203
Maiss, E., 1250
Maize (see Corn)
Maize chlorotic dwarf virus
—capsid proteins, serology, 1157
—MCDV-like particles, small RNA occurrence, 1195
—RNA characterization, 1157
—severity from double infection with mild isolates, 1189
Maize dwarf mosaic virus
—gene conditioning reactions, 1368
—host resistance effect on pathogenicity, 757
—Kansas isolate, serological relations, 1004
—oat-infecting strain, characterization, 113
—on sorghum, vector effect, 1189
—on sorghum and corn, Venezuelan strain, 1197
—strain A, genetics of reaction, 1364
Maize stripe virus, identification method, 1214
Maize white line mosaic virus
—particles, satellite nature, 1175
—on sweet corn and wheat, 1197
—transmission, 1188
Mallett, K. I., 1166
Malvick, D., 1159
Manandhar, J. B., 1217
Manganese, detection in wood decay, electron spin resonance, 1211
Manion, P. D., 315, 318
Manisterski, J., 1006
Manji, B. T., 1171
Manulis, S., 1177
Manuscript preparation, author's guide, 5, *378*
Mao, G. H., 1153
Maple
—sugar, decline and mortality, pH effect, 1142
—sulfur dioxide sensitivity, variation, 1004
Marais, A., 1105
Marasas, W. F. O., 1187
Marchetti, M. A., 375
Marek, E. T., 844, 1204
Margosan, D. A., 401
Marlow, J., 1191
Marois, J. J., 395, 908
Maroon, C. M., 1157
Marosy, M., 1290, 1293
Marsh, S. F, 1150
Marshall, J. M., 1004
Martensen, A. N., 1141
Martin, F. N., 1166, 1204
Martin, R. R., 869, 910, 1215, 1250
Martin, W. J., 505, 726
Martinez, J. P., 1186
Martinson, C. A., 166, 1005, 1147, 1192
Martyn, R. D., 375, 856, 1166
Marx, D. B., 1219
Masuhara, G., 1203
Masuko, M., 728
Matejka, J. C., 910, 1136
Matheron, M. E., 910, 1136
Mathieson, J. T., 1141
Mathre, D. E., 1216
Mathur, S. B., 727
Matsubara, D., 1160
Matsumoto, T. T., 596
Matsuura, K., 827
Matteoni, J. A., 1149
Matthews, F. R., 1164
Matthysse, A. G., 1210
Matyac, C. A., 1176
Maxwell, D. P., 518, 773
Mayes, M. S., 1195
Mayobre, F., 1197
Mayoral, M. L., 1197
Mazur, A. R., 373
Mazzola, M., 1159
McBlain, B. A., 1185
McCain, J. W., 1208
McCann, M., 946
McCarter, S. M., 371, 375
McClelen, C. E., 1189
McCoy, D. L., 1177
McCracken, F. I., 1143
McDaniel, L. L., 113, 1194
McDaniel, N. R., 1171
McDonald, B. A., 1186
McEntee, J. P., 1166
McEvoy, J. L., 1155
McGawley, E. C., 373
McGee, D. C., 1140
McGuire, R. G, 1210, 1276
McLaughlin, M. R., 230, 374, 1197
McLaughlin, R. J., 610, 1187, 1215
McLean, H. S., 1170
McLean, K. S., 191
McLean, K. W., 1192
McMaster, B. J., 1145
McMillan, R. T., Jr., 1184, 1213
McMullen, M. D., 1157, 1188, 1195
McMullen, M. P., 1005
McNabb, H. S., Jr., 1004, 1005, 1013
Meckenstock, D. H., 448
Medberry, S., 1158
Medina, V., 820
Medrano, C., 1309
Meier, S., 1138
Melampsora medusae, on cottonwood, somaclonal variation in resistance, 805
Meloidogyne incognita
—on cotton, yield effect, 640
—on tobacco, growth and soil moisture, 1135
—on vegetables, soil solarization for, 1177
Melouk, H. A., 375, 1175
Melvin, B., 1153
Menetrez, M. L., 1145
Menge, J. A., 1138, 1146, 1223
Mengistu, A., 1207
Meronuck, R. A., 1140, 1188, 1196
Merrifield, K., 910
Merrill, W., 1143
Mew, T. W., 322, 1136
Meyer, J. R., 1146
Meyer, R. J., 1212
Micales, J. A., 1220
Michailides, T. J., 547, 910, 1164
Michelmore, R. W., 888
Mielke, M. E., 1142
Mihail, J. D., 848
Mihuta-Grimm, L., 1162
Milcic, J. B., 1183
Miles, M. N., 375
Miles, N., 1154
Milgroom, M. G., 1163
Milholland, R. D., 535, 1193
Miller, A. E., 1109
Miller, J. B., 1165, 1216
Miller, L. C., 373
Miller, L. I., 1183
Miller, M. E., 375, 1162
Miller, N. R., 1148
Miller, S. A., 1139
Miller, S. M., 1139
Miller, T., 1165
Miller, T. L., 1186
Milus, E. A., 1142
Mims, C. W., 376, 1145
Mink, G. I., 613, 908, 911
Minsavage, G. V., 1210, 1211
Minton, N. A., 934
Mirocha, C. J., 1186, 1187
Misaghi, I. J., 910
Mischke, S., 1177
Misra, M. K., 1140
Mitchell, D. J., 1166, 1180, 1223
Mitchell, R. J., 1221
Mittak, V. L., 995
Miyagi, Y., 1091
Mizell, R. F., 1137, 1206
Mizumoto, C. Y., 322
Mo, Y.-Y., 1178
Moayeri, A., 1178
Models
—barley leaf rust, progress measurement in pure and mixed stands, 968
—bean rust epidemics, temporal and spatial development from line source, 146
—crop yield and plant damage, distribution-free method for estimation, 1229
—early and late blight of potato, suppression strategies, 590
—multiple regression, leaf rust of wheat, 1233
—regression, hypoxylon canker on aspen,

tissue culture as variable, 318
—temperature variation in solarized soils, 506
—wheat leaf rust disease gradient, 241
Modesto Olanya, O., 1163
Moesziomyces penicillariae, cultures of, preservation method, 377
Mogen, K. L., 1205
Moller, W. J., 1169
Moltzan, B. D., 1005
Momol, E. A., 1204
Monahan, J. F., 1135
Monilinia spp.
—*M. fructicola*: agri-chemical effect on, 1171; on peach, genotype resistance to, 1183; on peach, spore quality, 401; on sour cherry blossoms, temperature and wetness effect, 530
—*M. oxycocci*, on cranberry, seasonal occurrence in Wisconsin, 1163
Monoclonal antibodies
—*Agrobacterium tumefaciens* biovar 3, for indexing grapevine material, 995
—carlaviruses detected by, 912
—*Erwinia amylovora* characterized by use of, in ELISA, 610
—luteovirus discrimination by, epitope identification, 869
—serological identification of *Xanthomonas* isolates, 780
—specificity for *Xanthomonas campestris* pathovars, 322
—*Spiroplasma* spp. identified by, differentiated by serological probes, 880
—tomato spotted wilt virus detection by, 61
Montgomery, M., 377
Moody, K. M., 1137
Moore, L. W., 909, 912, 1181, 1215
Moorman, G. W., 367, 1207
Mora, B., 1179
Morgan, D. P., 1194
Morley, M. G., 1137
Morris, T. J., 1174, 1195
Morris, V. L., 1210
Morrison, D. J., 482
Moscow, D., 1085
Moss, M. A., 865, 1190
Moss, M. M., 1184
Moyer, J. W., 757, 1157, 1189
Mucharromah, 1144
Mucor piriformis
—fruit decay from, insect relation, 910
—on pear, temperature effect on survival and pathogenicity, 547, (550, 553), *818*
—on pear fruit, fungicide combinations for, 121
—in pear orchard soils, population dynamics, 657
—on stone fruit endocarps, survival, 1164
Mullen, J. M., 1139, 1155
Mullins, J. A., 372
Mundt, C. C., 241
Murata, H., 1155
Murphy, J. F., 1214
Murphy, J. P., 1142
Murray, T. D., 787, 1043, 1048, 1166
Muskmelon
—Alternaria leaf blight, fungicide persistence, 1206
—*Fusarium oxysporum* on, root colonization, 1095
—Fusarium wilt: planting date effect, 1146; resistance to races 0, 1, and 2, inheritance, 1201
—virus titer as resistance index, 1162
—viruses and aphids of, incidence and distribution in Texas, 1162
Mycena citricolor
—cell wall-macerating-enzyme activity, 1192
—on coffee, magnesium oxalate in lesions, 783
Mycoherbicide, *Septoria silybi* for milk thistle, 1085
Mycoplasmalike organisms
—animal mycoplasmas compared to, 16S rRNA sequence, 1206
—aster yellows: identification using specific DNA probes and RFLP analysis, 1206; monospecific polyclonal antibodies for, 1137
—on green and white ash, infection effect, 579, (581)
—hybridoma antibodies reacting to infected plants, immunization, 1209
—ribosomal RNA oligonucleotide sequences for, detection, 1206
—strains distinguished by nucleic acid hybridization, 1137
—western aster yellows, RNA gene, sequence analysis, 1138
—western X-disease, phylogeny, 1138
—on white ash, root damage, 1165
Mycorrhizae
—cotton, onion, and pepper, root age and position effect, 1138
—*Laccaria*, mating type and population genetic analysis, on black spruce, 694
—spore production in sand-vermiculite medium, 1138
—vesicular-arbuscular: aluminum acid soil tolerance, screening for, 1223; distribution in Brazil soil, 1222; species acronyms, 1138
Mycosphaerella spp.
—*M. graminicola*, illustrations of, 1217
—*M. populorum*, on *Populus deltoides*, ascospore production, germination, and infection, 1013
Mycotoxins
—cercosporin, accumulation in culture, 213
—ergotamine, quantitative immunoassay, 1188
—*Fusarium*, cereal seedling bioassay comparison for, 1187
—in peanuts, fungicides for control of toxin and fungus, 1188
—*Pyrenophora tritici-repentis*, on wheat, disease reaction, 740
—trichothecene: role in pathogenesis by *Gibberella zeae*, 404; role in pathogenicity of *Fusarium sporotrichioides* on parsnip, 170
—zearalenone, glycoside formation in fermentation, 1187
Myers, L. D., 61
Myrold, D. D., 909
Myrothecium roridum, biocontrol agent for *Phytophthora cinnamomi*, 1079
Myzus persicae, potato leafroll virus vector, detection, 963

Nabben, D. J., 83, 1167
Nagahashi, G., 1199
Nagata, R. T., 1190, 1194
Nameth, S. T., 1180, 1197
Narayanan, K. R., 1213
Nault, L. R., 1189
Navarro, L., 820
Navot, N., 562
Neate, S. M., 1203
Neck, J. S., 1138, 1151, 1176
Nectarines
—brown rot of, postharvest, chemical and biological methods, 1215
—cultivars for export, disease development in, 1171
Nectria haematococca, mutants of, adhesionless, characterization, 1208
Neher, D. A., 1180
Nelson, B. D., 1358
Nelson, E. B., 1009, 1147
Nelson, E. L., 1318
Nelson, M. R., 908, 1219
Nelson, N., 1216
Nelson, P. E., 1187
Nelson, R., 1185
Nelson, R. S., 1284
Nelson, S. C., 1163
Nematicide, fenamiphos, activity on corn and *Rhizoctonia*, 934
Nematodes
—acetyl cholinesterase classes, 1151
—extraction efficiency, factors, 910
Nemec, S., 1200
Nesmith, W. C., 267, 1203
Neucere, J. N., 1192
Neurospora crassa, carotenoid-overproducing transformants, cercosporin resistance, 1172
Nevill, R. J., 1220
Newcomb, E., 379
Newcomb, G., 910
Newcombe, G., 1169
Newhouse, J. R., 1173
Nickrent, D. L., 1205
Nida, D. L., 1158
Nielsen, M. T., 271, 1186
Nilaparvata lugens, rice ragged stunt virus vector, 235
Noel, G. R., 1005
Nordeen, R., 1145
Nordeen, R. O., 1155, 1178
Norman, B. L., 1184
Norton, M. V., 1137
Novacky, A., 1166, 1180
Nuckles, E. M., 1152
Nus, A., 1152, 1163, 1221, 1222
Nutter, F. W., Jr., 375, 814, 837, 958, 1135, 1179, 1213
Nygaard, S. L., 773
Nyhus, K. A., 166

Oak
—decline, growth ring indicators, 1143
—live, measurement of wilt centers, 1318
—wilt of, biological and chemical control, 372
Oats
—barley yellow dwarf virus on, nonspecificity, 942
—cyst nematode, pathotypes and protein patterns, 927
—*Pythium* on, survival and agronomic traits, 1142
Obituaries
—Mitrofan Michaelovich Afanasiev, 725
—Myron Port Backus, 379
—Irvin Lynnell Forbes, 726
—Alexander Murdoch French, 127
—Lysle D. Leach, 1007
—Pierre Paul Ferdinand Mourier de Neergaard, 727
—Lowell Wendell Nielsen, 819
—Antonios George Plakidas, 505
—Howard Spencer "Spence" Potter, 1008
—Robert Marshall Pratt, 380
—Leon John Tyler, 381
O'Brien, R. D., 619, 910
Ocamb, C. M., 1166
Odvody, G. N., 448
Ogawa, J. M., 547, 910, 911, 1007, 1164, 1171, 1183
Ogura, H., 162
Okamoto, D., 1095
Okuno, T., 827
Olah, A. F., 1186
Olanya, O. M., 375, 1119
Oliva, N., 1185
Olive, J. W., 371
Olive, *Pseudomonas syringae* on, in Italy, selective medium for isolation, 185

Olson, A. J., 1190
Olson, L. W., 1066
Olson, T. N., 1167
Olszewski, N. E., 1158
Omran, T. M., 1176
O'Neal, W. B., 1168
O'Neill, N. R., 750, 1208
Ong, C.-A., 613
Onion
—Botrytis leaf blight, fungicide applications and predictive system, 493
—pink root of, cultivar growth in organic soil with *Pyrenochaeta*, 1194
—Stemphylium leaf blight of, etiology, 301
Onyike, N. B., 1187
Ooka, J. J., 1004
Opgenorth, D. P., 911
Ophiodothella vaccinii, host-parasite relations, 1145
Ophir, Y., 1177
Oppenheim, A. B., 1246
Opperman, C. H., 1151
Orchids, cymbidium mosaic and odontoglossum ringspot viruses, in Singapore, 1149
Ordentlich, A., 1246
Orlowsky, J. I., 911
Ornithogalum mosaic virus, South African isolates, properties, 385, (387)
Orser, C. S., 911
Ortega, C., 820
Osborne, L. S., 1161
Osborne, W. W., 1171
Osorio, J. M., 911, 1171
Ostrinia nubilalis, on corn, recurrent selection for resistance, 166
Ostrofsky, W. D., 1220
Otrosina, W. J., 1144, 1164
Ouimette, D. G., 761
Ownley, B. H., 1159
Ozmon, E. V., 1209
Ozone
—clover-fescue pastures affected by, long-term exposure and soil moisture, 128
—concentration in remote forests, in north central Pennsylvania, 1220
—forest tree response, in Pennsylvania, 1144

Pachymetra chaunorhiza, on sugarcane
—quantitative assay in Australia, 1302, (1303)
—sampling strategies, 1306
Pacumbaba, R. P., 376, 1192
Padgett, G. B., 814
Pair, J. C., 1221
Paje-Manalo, L. L., 457
Palmer, M., 1143
Palukaitis, P. F., 1175
Pan, S. Q., 1150, 1199, 1200
Panabières, F., 1105
Panaccione, D. G., 1172, 1200, 1204
Panopoulos, N. J., 903
Papavizas, G. C., 1160
Papaya ringspot virus
—on *Cucumis metuliferus*, nitrous-acid induced strains, 1257, (1258, 1260)
—monoclonal antibodies for detection, antigenic diversity, 1214
Papke, K. E., 1202
Pappu, H. R., 1215, 1253
Parent, S., 1222
Park, H. S., 1198
Park, Y.-H., 1209
Parke, J. L., 1159, 1327
Parker, D. M., 278, 1171
Parks, T. D., 1158
Parlevliet, J., 1200
Parmeter, J. R., Jr., 768
Pataky, J. K., 1005, 1168
Paterson, J. M., 1179
Patterson, C., 376
Patterson, C. L., 1162
Patton, R. F., 539, 1290, 1293
Paulitz, T. C., 911
Paulus, A. O., 1168
Payne, G. A., 180, 757, 1172, 1204
Pea
—disease resistance response gene: regulation using attachment sites and topoisomerases, 1184; tobacco and potato transformed with, 1207
—root colonization by fluorescent pseudomonads, 1327
Peach
—*Botryosphaeria dothidea* in orchards, ascospore and conidial dispersal, 635
—canker: low virulence and dsRNA association, 568; wounding and cultivar variation, 627
—green ring mottle disease, mechanically transmissible virus association, 451, (454)
—*Monilinia fructicola* on, spore quality, 401
—Phomopsis bud and twig blight, in Georgia, 1154
Peanut
—*Aspergillus* infection, electrophoretic characterization of enzymes, 1151
—calcium effect in fruiting zone, 372
—*Cercospora arachidicola* and *Cercosporidium personatum* on, host genotype effect, 1201
—copper compounds for disease control, efficacy, 1171
—foliage diseases, fungicides and oils for control, 371
—late leaf spot of, spatial and temporal analysis of spread, 837
—leaf spot of: assessment with multispectral radiometer, 1179; partial resistance components, 136; yield loss related to healthy leaf area, 1179
—mycorrhizae and nematode effect, 372
—plant disease gradients, detection and measurement with radiometer, 958
—pod rot, occurrence in Oklahoma, 1192
—*Pythium myriotylum* on, inoculum density factor, 1167
—*Rhizobium* and mycorrhizal relations, cosymbiosis, 1138
—rust of, infection process ultrastructure, 376
—Sclerotinia blight: detection in seed in Texas, 1176; fungicide RH3486 for, 1170; seed transmission, 375
—*Sclerotinia minor* of, seed transmission, 1140
—southern stem rot, suppression with insecticides, 1169
Peanut stripe virus
—on soybean and lima bean, epidemiology, 372
—ultrastructural comparison of blotch and stripe variants, 156, (158-160)
Pear
—fruit russetting, epiphytic bacteria association and IAA production, 1191
—gray mold, postharvest biocontrol, 1153
—*Mucor piriformis*: in orchard soils, population dynamics, 657; temperature effect on pathogenicity, 547, (550, 553), *818*
—postharvest disease, biocontrol with *Pseudomonas*, 1216
Pearson, R. C., 1163
Pecan
—histochemical localization of phenolics, 372
—Phytophthora shuck and kernel rot, 1193
—powdery mildew, cultivar resistance and kernel development, 1155
—scab and leaf blotch of, effect on gas exchange, 1203
Pedersen, C. T., 1222
Pedersen, W. L., 1003, 1004
Pederson, V. D., 1201, 1213
Pedicularis resupinata, blister rust of, histopathology of infection, 539, (542-545)
Peet, R. C., 903
Pelargonium flowerbreak virus, pH-mobility curve, 661
Pell, E. J., 1144
Pelletier, J. R., 511, 590
Pemberton, I. J., 230
Penicillium spp.: green pigmentation, melanin inhibitors, 1212; on stored corn, growth and sporulation factors on genotypes, 1101
—*P. expansum*, on pear, postharvest decay, fungicide combination, 121
Pennisetum spp.
—*P. americanum*, rust resistance, 376
—*P. glaucum*, ergot of, resistance and screening, 1323
Pennypacker, B. W., 436, 1144
Pennypacker, S. P., 1149
Penswick, J. R., 1158
Pepper (see also *Capsicum annuum*)
—bacterial spot and insects of, chemical treatments and yield effects, 375
—geminivirus of, characterization, 1214
—Phytophthora root and crown rot, factors, 1219
—tigré disease of, whitefly-transmitted geminiviruses, 908
—tobacco etch virus of, multiple resistance levels, 814
Pepper mild mottle virus, mesophyll protoplast infection, electroporation use, 1184
Percich, J. A., 1187, 1209
Pereira, A-M. N., 1348, 1353
Perez, B. A., 1183, 1200, 1201
Pérez, Y., 1138
Peridermium harknessii
—isozyme characterization with gel electrophoresis, 444
—zymodemes of, aeciospore nuclei, 1164
Perkins, B. L., 1199
Perkins, J. M., 1183
Perkins-Veazie, P., 1196
Permar, T. A., 780, 1174, 1261
Peronosclerospora sorghi, on sorghum, loss assessment using near-isogenic populations, 448
Peronospora spp., host family and genera of, geographic distribution, 1176
—*P. manshurica*, on soybean, races 2 and 33, resistance inheritance, 877
—*P. tabacina*: isolate differences, detection using leaf disk bioassay, 1203; sporangia of, germination, leaf extract effect, 1145; on tobacco, genotype differences in duvatrienediols, 271; on tobacco, immunization, 1150; on tobacco, partial resistance components in six genotypes, 606; on tobacco, resistance, 267; on tobacco, resistance, leaf surface component effect, 1024; on tobacco, resistance induced sytemically, immunization, 979; on tobacco, systemic infection factors, 865; on tobacco, systemic resistance induced, 1152; transport, climatology and trajectory, 1135
—*P. trifoliorum*, on alfalfa, minor gene resistance, 721
Perring, T. M., 1123
Peters, D., 963
Petersen, F. P., 1139
Peterson, G. L., 297, 596, 1203
Peterson, J. L., 1154
Pettinger, A., 1184

Pettit, R. E., 1151
Pfender, W. F., 873, 1152, 1163, 1217, 1222
Phaseolus vulgaris
—angular leaf spot of, maize intercrop effect, 1135
—bacterial brown spot: nonrandom patterns, 674; spatial patterns, 1162
—common bacterial blight, plasmid DNA probe for detection, 518
—rust of: density dependent fitness interaction, 409; factors affecting lesion size, 1035; resistance and leaf development stage, 1028, (1031)
—rust epidemics in, temporal and spatial development from line source, 146
—white pine blister rust infection, histopathology, 539, (545)
Phellinus weirii, on Douglas-fir, stand conditions, 1143
Phialophora spp.
—*P. gregata*, soybean and adzukibean isolates, restriction fragment length polymorphisms, 1172
—*P. malorum*, on pear fruit, fungicide combinations for, 121
Philips, T. R., 1003
Phillips, D. J., 401
Phillips, D. V., 1148
Phipps, P. M., 1170
Phoma macdonaldii, selective medium for, 1212
Phyllosphere, bacteria in, sampling and recovery method, 1176
Phytoalexins
—furanocoumarin, in parsnip by *Fusarium sporotrichioides*, 170
—scoparone, on citrus from *Phytophthora* infection, 736
Phytophthora spp.: identification using DNA polymorphism analysis, 1105; phosphite effect on, mode of action, 921; phosphonate compound effect on isolates, 761; on raspberry, occurrence and pathogenicity, 93, (95, 98); on vegetation in rivers used for irrigation, 1219
—*P. cactorum*, on strawberry, splash dispersal from canopy, 425
—*P. capsici*: oospore density relation to mortality, 1166; on pepper, periodic flooding effect, 1223; pepper isolates, in New Mexico, 1212
—*P. cinnamomi*: anatomy of infected roots, 417, (419-423); on avocado, effect of flooding, 204; biocontrol with *Myrothecium roridum*, 1079; disease resistance from, tissue culture system, 1221; mating types in South Africa, biogeography, 1185; on pine root tips, inoculum density, 1109; on pine root tips, oxygen concentration effect, 1114
—*P. citrophthora*, on citrus, phytoalexin association with fosetyl-Al and phosphorous acid, 736
—*P. fragariae*, on strawberry: races, identification criteria, 535; sporangial and oospore production, 1193
—*P. infestans*: American and European isolates, dsRNA characterization, 1173; dsRNA, detection, 470; mating type change, metalaxyl induction, 1205; Peruvian isolates, isozyme analysis and DNA content, 478; on potato, control, simulation models, 590; on potato, culture filtrate effect on protoplast, 1145; on potato, metalaxyl-resistant populations, 832; on potato, race-specific interactions, lipid metabolism, 898; on potato and tomato, host specificity, 1145
—*P. megasperma*: isolates of, isozyme variability, 773; metalaxyl resistance in, naturally occurring, 1169; in soil, assays for detection, 1139; on soybean, abscisic acid measured by ELISA, 1238; on soybean, glyceollin elicitation, from virulent progeny, 1186; on soybean, rate-reducing resistance, 1006; on soybean, virulence inheritance, 1185
—*P. parasitica*: on citrus, rootstock effect on populations, 1180; cloned DNA probes for identification, 716; on lemon and tomato, relative virulence, 910; on tobacco, resistance components, 1183; tobacco resistance to, evaluation using detached leaves, 1186
Phytotoxins
—cercosporin, carotenoid role in resistance, 180
—dihydrofusarubin and isomarticin, from *Fusarium solani*, effect on lemon, 700
—stem canker of soybean, role of toxin, 499
Piechocki, M., 908
Pierce, M., 1199
Pike, L. M., 375
Pine (see also *Pinus radiata*)
—eastern white, needle blight fungi, 1143
—jack, Armillaria root rot, defoliation relation, 1166
—littleleaf disease, screen for resistance, 1221
—loblolly: ozone effect on mycorrhizae and carbohydrates, 1138; water localization patterns, magnetic resonance microscopy, 1221
—longleaf, Rhizoctonia seedling blight, control, 1142
—ponderosa: *Dendroctonus* spp. on, mixed inoculation effect, 768, (769, 770); *Heterobasidion annosum* on, host specialization, 290
—red, Scleroderris shoot blight, low temperature and conducive day concept, 1293
—Scleroderris shoot blight, spore production and inoculation techniques, 1290
—seedling mortality, fungi association in agricultural sites, 1221
—shortleaf and loblolly, *Phytophthora cinnamomi* on root tips of: inoculum density, 1109; oxygen concentration effect, 1114
—slash, damping-off of seedlings, fungi, 1220
—*Sphaeropsis sapinea* on, in South Africa, 1143
—thiram seed treatment, 1221
—white, Phytophthora root rot, in Pennsylvania, 1167
Pineapple
—fruitlet core rot, variation in prediction, 1155
—mealybug wilt and closterovirus, 1337, (1339), 1341, (1343)
Pinnow, D., 372, 1140
Pinus radiata (see also Pine), disease threat, perspectives on monoculture, 1142
Pitblado, R. E., 1177
Plantain, decline of, somoclonal variations in root development, 1207
Plasencia, J., 1187
Plasmodiophora brassicae, detection serologically, dot immunobinding, scanning electron microscopy, 1066, (1067-1070)
Plasmopara spp., host family and genera of, geographic distribution, 1176
Plattner, R. D., 170
Ploetz, R. C., 204, 1181
Plum pox virus, cloning from dsRNA, 1250
Poetter, K. F., 1185
Pohronezny, K., 1190
Poinsettia, stem canker, *Pseudomonas* cause, 1168
Pokorny, J. D., 1188
Pollard, L. W., 322
Polston, J. E., 1123
Pond, E., 1146
Pope, D. D., 1203, 1205
Popenuck, T., 1164
Poplar
—Melampsora leaf rust of, rating scale, 1005
—*Septoria musiva* on, aggressiveness, 413
Poplawsky, A. R., 1143, 1182, 1211
Populus spp. (see also Aspen and Cottonwood), transformation with proteinase inhibitor II gene, 1004
—*P. deltoides*, Septoria leaf spot and canker on, spore production and infection, 1013
Porter, D. M., 1140, 1176
Porteus, A., 1176
Postharvest pathology
—bean invasion by storage fungi, model for prediction, factors, 1188
—breeding and biotechnology, 1375
—citrus, fruit exocarp to *Penicillium digitatum*, 1196
—environment, manipulation, 1377
—fruits and vegetables, management, colloquium, 1373-1390
—grain storage, fungi suppressed with soybean oil, 1140
—harvest of hardwood stands, damage to trees from mechanized harvester, 1220
—host defenses, wounds, 1381
—microflora, management, 1387
—*Mucor piriformis* on pear, temperature effect on survival and pathogenicity, 547, *818*
—muskmelon red rot, 1196
—nutritional factors, alteration, 1384
—peach and apple, biocontrol with yeasts, 1187
—pear fruit wounds: fungicides for, 121; immersion dumping effect on infection, 1187
—*Penicillium* on corn genotypes in storage, growth and sporulation factors, 1101
—pome fruit storage rots, control with *Pseudomonas cepacia*, pyrrolnitrin, 1187
—research, importance, 1374
—tomato anthracnose, factors, 1063
—wheat storage fungi, resistance to invasion, 1196
Postia placenta, physiological and structural characteristics, 1220
Postman, J. D., 1196
Potato
—*Colletotrichum coccodes* on, 1146
—common scab, population dynamics, 681
—*Corynebacterium sepedonicum* on stems of, population density, 946
—early blight, resistance components, plant age effect, 511
—early and late blight, simulation models, 590
—early dying, *Verticillium* and *Meloidogyne* and irrigation as factors, 911
—emergence and yield, fungicide seedpiece treatment, 1207
—foliage fungicide sprays and *Sclerotinia* and *Verticillium* reactions, 1152
—late blight, isozyme analysis of fungus isolates, 478
—metalaxyl accumulation in tubers, foliar irrigation, 1169
—phytoalexin elicitation, substrate partitioning using sterols, 1151
—Rhizoctonia canker of, protection with *Rhizoctonia*-like fungi, 1152
—*Rhizoctonia solani* AG-3 on plants and soil, isolates, 1180
—soft rot, bacterial and plant gene expres-

sion, 1150
—soil and tuberborne diseases of, in South Dakota, 1194
—tuber soft rot, hypoxic resistance, 1190
—*Verticillium* and drought stress effect, 1213
—*Verticillium dahliae* of, photosynthesis reduced by, mechanism, 1151
Potato leafroll virus
—coat protein gene, nucleotide sequence, 1157
—monoclonal antibodies for strain discrimination, 869
—in plants and aphids, detection, 963
Potato spindle tuber viroid, mutated cDNAs of, infectivity, 1195
Potter, B. D., 1218
Potyviruses, on maize, sorghum, and sugarcane, taxonomy of, polyclonal antibody reactivity, 223
Powell, C. A., 1174
Powell, C. C., 1149
Powell, P. A., 1284
Powelson, M. L., 910, 911
Prakash, C. S., 805
Pratt, P. W., 1006, 1206
Pratt, R. G., 209, 1202
Pratylenchus neglectus, on alfalfa, pathogenicity, 909
Prince, V., 1176
Proctor, F. J., 1195
Provvidenti, R., 1197
Prunus necrotic ringspot virus
—monoclonal antibodies, 911
—nucleoprotein components, agarose gel electrophoresis, 613
—nucleoproteins and nucleic acid, electrophoresis, 908
—in peach, distribution after graft, 377
Pruvost, O., 1191
Pseudocercosporella herpotrichoides, on wheat: epidermal cell response, 1043; resistance inheritance, 1048
Pseudomonas spp.: fluorescent, siderophore production, 910; genetically engineered strains, acquisition by bees on strawberries, 1151; on sugar beet seed, effects on seed rot and damping-off, 709; take-all suppressed by, antibiosis role, 143
—*P. cepacia*, biocontrol agent, inhibition of soilborne pathogens, 1159
—*P. fluorescens*: on pea taproots, mutant strains, 1159; pea root colonization by, 1327; take-all of wheat suppressed by, pH effect, 1159; TN5 insertion mutants of, antibiotic products altered by, 910; tobacco black root rot suppressed by, iron relation, 584; zinc resistance in, characterization, 1178
—*P. gladioli*, on iris, cause of scorch, 1006
—*P. savastanoi*, IAA operon of, insertion sequence-mediated deletion, 911
—*P. solanacearum*: avirulence gene of, cloning and involvement in host range, 1156; extracellular polysaccharide slime and virulence, molecular characterization, 1156; extracellular polysaccharide synthesis, gene regulation, 1178; genetic alteration, growth in rhizosphere soil, 1223; strain AW1, hypersensitivity in host plants, DNA region cloning, 1211
—*P. syringae*: on *Abelmoschus*, leaf spot and blight, 371; avirulence gene D from, regulation using novel Lux system, 1179; on bean, DNA hybridization probe for identification, 903; on bean, syringomycin production affected by, locus required, 1178; in cherry, copper resistance, conjugative plasmid association, 861; from cherry, plasmids of, characterization, 1179; copper resistance genes, *LacZ* fusions, cellular localization of proteins, 1179; coronatine-defective phenotype, plasmid mutation, 1211; coronatine production by, genetic analysis of cloned DNA sequence, 1210; on cucumber cotyledons, hypersensitivity, effect on membrane fatty acids, 705; epiphytic population sizes, plant and environment effects, 619; epiphytic survival, phaseolotoxin gene hybridization probe, 1190; genetic locus requirement, 1210; ice nucleation-active, *Candida* antagonistic to, 275; indole acetic acid lysine conjugation from, gene, 1145; mutants of, growth effect, 1208; pathogenic determinant, characterization, 1210; on pear, blossom infection, 912; on pear, endophytic distribution, 1182; phytotoxin biosynthesis genes in, genetic and DNA sequence analysis, 1178; on snap bean, nonrandom patterns of brown spot, 674; on soybean, gene-for-gene interaction, 1144; on soybean, motility and role in infection, 284; strains on leaf surfaces, dynamics, 1162; syringotoxin production, genetic analysis, 1178; on tobacco suspension cells, hypersensitivity induced, 974; on tomato, fatty acid profiles, 1181; on tomato, genomic fingerprinting, 745; on tomato, putative null gene effect, 1177
—*P. syringae* pv. *savastanoi*, selective medium for isolation, 185
—*P. viridiflava*: pectate lyase from, hydrolysis of potato tuber cell walls, pectin organization, 1199; on red clover, interaction with *Fusarium avenaceum*, 436, (437, 438)
Pseudoperonospora cubensis, virulence on host maintained, 376
Puccinia spp., urediniospore survival in atmosphere, 1217
—*P. helianthi*, on sunflower: gene Pu_6, new gene, 474; race nomenclature and gene designation for resistance, 1232
—*P. hordei*: on barley, disease progress in pure and mixed stands, 968; on wild barley, resistance, 1006
—*P. jaceae*, on yellow starthistle, temperature and moisture effect, 1152
—*P. melanocephala*, on sugarcane, cultivar susceptible to, 1202
—*P. punctiformis*, teliospore germination of, alkyl isothicyanate as stimulants, 1198
—*P. recondita*: populations of, virulence and phenotypic diversity in Canada, 1185; on triticale, resistance inheritance, 731; on triticale, slow-rusting and hypersensitivity, 101; on wheat, adult-plant resistant, temperature effect, 391; on wheat, biocontrol with *Erwinia herbicola*, 990; on wheat, disease gradient model, 241; on wheat, latent period inheritance, 1207; on wheat, nomenclature for, North American system, 525; on wheat, nonrandom distribution of virulence in populations in Canada, 1313; on wheat, populations in USA in two years, 1218; on wheat, race dynamics in Canada, 349; on winter wheat, multiple regression model, 1233
—*P. sorghi*, on corn leaves, nonadherence without wax, 1175
—*P. substriata*, on pearl millet, forage yield and digestibility effect, 1180
—*P. zoysiae*, on zoysiagrass and *Paederia scandens*, microscope study, 1217
Pueppke, S. G., 1198
Purcifull, D. E., 1213, 1214
Putnam, M. L., 1180
Pyrenophora spp., restriction fragment length polymorphism, analysis as taxonomic tool, 1173
—*P. teres*, on barley, host specialization, 1218
—*P. tritici-repentis*: ascocarps on wheat straw, herbicide effect on, 1222; cultivar-specific toxin from, purification, 1006; residueborne, biocontrol, 1152; on wheat, disease progress, primary inoculum effect, 873; on wheat, toxin association, disease effect, 740, (743)
Pyricularia oryzae, on rice, systemic fungicide ferimzone effect on, 827, (829-831)
Pythium spp.: bacteria antagonistic to, aerobactin iron uptake system, 909; isozyme comparisons of eight species, 1185; soil populations, peanut cultivar reaction to, 374; survival in composted manure, 908; *Trichoderma* effect on, culture filtrates, 374
—*P. irregulare*, thermal inactivation in soil, 375
—*P. splendens*, sexual reproduction, hormonal regulation, 1205
—*P. ultimum*: damping-off from, biocontrol with *Gliocladium virens* in soilless mix, 361; sporangia, germination, exudate effect, 1147; sporangial production, germination and exudates, 1009; on sugar beet seed, effects on seed rot and damping-off, 709

Qhobela, M., 1191
Quigley, N. B., 1178
Quisenberry, S. S., 1146

Raabe, R. D., 1168, 1218
Raboy, V., 1173
Radin, D. N., 1208
Rahman, H., 1185
Raid, R. N., 1194, 1202
Rama R. Urs, N. V., 1232
Ramsdell, D. C., 451, 488, 1173
Randall-Schadel, B. L., 1212
Rane, K. L., 1149
Rao, D. V., 783, 1192
Rao, M. N., 267, 271, 979
Rao, V. P., 1323
Rasmussen, J. B., 1204
Rasmussen, O. F., 1019
Rasmussen, S. L., 912, 1131
Raspberry, root rot, isolation frequency of *Phytophthora* spp., 93, (95, 98)
Raspberry leaf spot virus, cloning from dsRNA, 1250
Ratcliff, A., 1164
Ratnayake, M., 1196
Rebbeck, J., 128
Rechcigl, N. A., 156
Red clover necrotic mosaic virus
—electrophoretic variability, 1253
—in *Nicotiana* spp. protoplasts, independent replication, 457
—polymerase expression modulation, ribosomal frameshifting, 1194
Reddick, B. B., 951
Reddy, A. P. K., 1217
Redlin, S. C., 1196
Reeck, G. R., 1006
Rehms, L., 1181
Reichard, D. L., 425, 1219
Reilly, C. C., 1193
Resistance
—alfalfa: to anthracnose, races, 750; to downy mildew, minor genes, 721
—bean to rust, leaf development stage effect, 1028
—corn to anthracnose and northern corn leaf blight, 166; after recurrent selection for stalk rot and corn borer resistance, 166
—corn to maize dwarf mosaic virus, 757
—cottonwood to leaf rust, somaclonal varia-

tion, 805
—cucumber to anthracnose, induction by phosphates, 176
—lettuce to downy mildew, gene-for-gene analysis, 888
—peanut to Cercosporium leaf spot, components, 136
—pearl millet to ergot, 1323
—pepper to tobacco etch virus, 814
—postharvest diseases, 1375
—potato to early blight, resistance components, 511
—selection for, in disease stress environment, 70
—soybean to downy mildew, 877
—sunflower to rust, new gene *Pu*$_6$, 474
—tobacco to blue mold: genotype differences in duvatrienediols, 271; leaf surface component effect, 1024; resistance components, 606; role of duvatrienediols, 267; systems, 979
—tobacco to diseases, analysis using somaclones, 600
—triticale to leaf rust: inheritance, 731; slow-rusting, 101
—watermelon to *Fusarium oxysporum*, induced, 856
—wheat to leaf rust, temperature effect, 391
—wheat to strawbreaker foot rot: epidermal cell response, 1043; resistance inheritance, 1048
Restriction fragment length polymorphisms, *Xanthomonas campestris* strains, means of distinguishing, 793
Reuveni, M., 267, 1024
Reuveni, R., 1150
Reviewers, acknowledgment of, 1
Rey, M. E. C., 1188
Reynolds, K. L., 1164
Reynolds, K. M., 425
Rezabek, C. L., 1142
Rhinhart, K. E. L., 1217
Rhizoctonia spp., on bedding plants, nursery plants, and vegetables, in Australia, 1203
—*R. solani*: AG 4, DNA restriction polymorphism, 1147; anastomosis and intraspecific groups, phylogenetic relations, 1205; anastomosis group one, sclerotial and basidial cymes, comparisons, 1212; anastomosis groups 2, 3, 4, and 5, DNA plasmids in, 1205; in bark compost, suppression by fungi, 1152; biocontrol with *Gliocladium virens* in soilless mix, 361; centipede grass host, water stress and pH effect, 373; on corn, brace root infection, crop losses, 934; phenylacetic acid and virulence in, correlation, 1199; on radish, suppression by organic amendments, 1006; ribosomal RNA genes from, sequence analysis, 1186; on rice, systemic control with flutolanil, 1091, (1093); in soil, isolation media, 1147; on sugar beet, anastomosis groups, 83
Rhizosphere
—colonization, *Trichoderma* and *Fusarium* in competition, 198
—competence, *Trichoderma harzianum* and *Fusarium oxysporum*, competition role, 198
Rhoads, M., 1136
Rhoads, R. E., 1214
Rhopalosiphum padi, barley yellow dwarf virus vector, on oats, 942
Ribes nigrum, blister rust of, histopathology, 539, (542-545)
Ricci, P., 1105
Rice
—bacterial blight: genetic diversity, 1136; growth dynamics on cultivar leaves, 573; infection through hydathode, 433, (434); low-virulence strains of, 984; resistance component, 1200
—bacterial leaf blight, pathovar-specific monoclonal antibodies for, 322, (327)
—blast of: inoculum source in Arkansas, 1141; resistance, in near-isogenic lines, 1184; resistance prediction using multilocation trials, 1183; survival in Egypt, 1217; systemic fungicide for, ferimzone, 827, (829-831)
—disease resistance in, introgression from wild rices, 1185
—kernel smut, resistance to, 1141
—pest management, socio-biological environment, 1137
—sheath blight: cultivar resistance, 375; systemic control with flutolanil, 1091, (1093)
Rice ragged stunt virus, Echinochloa ragged stunt virus compared to morphologically, 235, (236-239)
Rich, J. J., 1178
Richards, T. L., 1136
Richardson, E. A., 376
Richey, M. G., 844
Ries, S. M., 284, 1168
Riffle, J. W., 1333
Rigling, D., 219
Rimmer, S. R., 1207
Rinaldelli, E., 1138
Rist, D. L., 65
Ristaino, J. B., 1219
Ritch, D. L., 478
Ritchie, D. F., 1182, 1191, 1192
Rittenburg, J. H., 1139
Rizzo, D. M., 290, 1220
RNA, double-stranded, plant virus clones, 1250
Roane, C. W., 1364, 1368
Roberto, F., 1145
Roberts, B. R., 1004
Roberts, D. A., 1162, 1174
Roberts, D. P., 1215
Roberts, P. D., 573, 1191
Roberts, R. G., 909
Rodgers, C., 1199
Rodrigues, C. A., 1198
Rodriguez, R. J., 1173
Rodriguez-Kabana, R., 1167
Roelfs, A. P., 1183, 1200, 1201, 1218
Roitman, J., 1187
Rollins, J. A., 1136
Romaine, C. P., 1272
Romanowski, V., 1309
Roncadori, R. W., 1139
Ronco, A. E., 1309
Roongruangsree, U., 1145
Rosa-Márquez, E., 1207
Rose
—powdery mildew, wetness level effect, 1149
—rosette, dsRNA association, 1139
Roseman, T. S., 1166, 1180
Ross, F. P., 1167
Rotem, J., 263
Rothrock, C. S., 1142, 1166
Rottinghaus, G. E., 1167
Rotylenchulus reniformis
—on cotton, pathogenicity, 1192
—population dynamics in crop rotation, 373
Rouse, D. I., 1151, 1213
Rowan, D. D., 1144
Rowden, R. G., 1159
Rowe, R. C., 1162, 1176
Roy, K. W., 191, 1192
Royer, M. H., 1219
Rufty, R. C., 606
Runion, G. B., 1142, 1221
Rupe, J. C., 1209, 1219
Ruppel, E. G., 1160
Rush, C. M., 1141
Russell, C. C., 1192
Russell, W. A., 166
Russo, J. M., 1219
Russo, V., 1198
Ryba-White, M. L., 1178
Ryder, M. H., 1159
Rytter, J. L., 367

Sackston, W. E., 1232
Saettler, A. W., 1188
Safflower, Phytophthora root rot, sodium uptake effect, 912
Safir, G. R., 1222, 1223
Sakamoto, Y., 162
Salas, B., 1005
Salch, Y. P., 1172
Salicornia sp., two new diseases of, 912
Salomon, R., 258
Sams, C. E., 1144
Sanborn, M. R., 61
Sanderson, F. R., 1217
Sanderson, P. G., 1164
Sands, D. C., 1176, 1181
Sarachu, A. N., 1309
Sasaki, K., 1199
Sauer, D. B., 1196
Sauter, H. P., 1219
Sayre, K. D., 1142
Schaad, N. W., 903, 1140, 1168, 1182, 1190, 1211
Schaffer, B., 204
Schardl, C. L., 844, 979, 1204, 1205
Scharen, A. L., 1173
Schell, M. A., 1223
Schenck, N. C., 374, 1138, 1139, 1222
Schenk, J., 1190
Schisler, D. A., 1159, 1203
Schizaphis graminum, barley yellow dwarf virus vector, on oats, 942
Schlagnhaufer, B., 1272
Schlumbergera truncata, Dreschlera cladophyll blight, 1218
Schmid, J., 1199
Schmid, P., 1168
Schmitthenner, A. F., 1147, 1169, 1185
Schneider, B. J., 911
Schneider, R. W., 1185
Schneider, S. M., 1135
Schnipke, V. M., 1004
Schuh, W., 1135
Schwartz, R. L., 1210
Sclerocystis spp., genus revision, 1222
Sclerospora graminicola, on pearl millet, pathogenic variation, 1145
Sclerotinia spp.
—*S. minor*, fungal antagonists to, 1345
—*S. sclerotiorum*: nuclear number and behavior, 1176; pathogenicity of, mutants for study, 1145; on sunflower, factors, 1358; on white bean, plasma membrane stability, 1148
Sclerotium rolfsii
—carbon loss in sclerotia, germinability relation, 1059
—survival in composted manure, 908
—*Talaromyces flavus* parasitic on sclerotia of, 1160
Scott, D. H., 1136
Scott, I. W., 1161
Scott, P. R., 1217
Scott, S. W., 377, 1175
Scutellospora heterogama, spore discovery, two suspensors, 1139
Sears, B. B., 1206
Seed pathology, seed testing and biopsy methods, 1140
Seem, R. C., 1164
Segner, S. L., 1176
Seidler, R., 1176
Seip, E. R., 1204

Septoria spp., on wheat, growth and temperature factors, 1216
—*S. glycines*, mutant variation in, ultraviolet irradiation, 1203
—*S. musiva*: extracellular proteinases of, 1005; on poplar, aggressiveness variability, 413
—*S. nodorum*: phytotoxic components from, effect on wheat callus culture, germ plasm screening, 1202; on wheat, survival in no-tillage soybeans, 1216
—*S. silybi*, on milk thistle, leaf infection, 1085
—*S. tritici*: genetic structure analysis, restriction fragment length polymorphism application, 1186; illustrations of, 1217
Sepulveda, P., 1188
Sequeira, L., 1178, 1191
Seshu, D. V., 1183
Shabeer, A., 1184
Shafer, S. R., 128
Shaffer, W. H., 1005
Shaheen, F., 1005, 1157
Shaik, M., 1028, 1035
Shain, L., 1165, 1221
Shaner, G., 101, 391, 731, 1207
Shaner, G. E., 1353
Shapira, R., 1246
Sharkey, T. D., 1151
Sharma, U., 1222
Sharp, E. L., 725
Shaw, J., 1181
Shaw, J. G., 1214
Shaw, P. D., 1210
Shearer, J. F., 1187
Sheets, C. J., 1215
Shefelbine, P. A., 1127
Shelby, R. A., 1188, 1212
Shen, H., 1179
Shepard, B. M., 1137
Shepherd, R. J., 1158
Sherald, J. L., 1165
Sherwood, J. E., 1205
Sherwood, J. L., 61, 1003, 1004, 1137
Shew, B. B., 136, 1146, 1201
Shew, H. D., 1146, 1183
Shirane, N., 728
Shishiyama, J., 827
Shishkoff, N., 301, 1180
Shokes, F. M., 1179
Shtienberg, D., 590
Shukla, D. D., 223
Siegel, M. R., 267, 271, 1024, 1144, 1203, 1205
Sievert, J., 1196
Sifuentes, J. A., 1218
Sillick, J. M., 1005
Silybum marianum, *Septoria silybi* on, biocontrol, 1085
Simini, M., 1144, 1220
Sinclair, J. B., 1006, 1205
Sinclair, W. A., 579, 1165
Singh, S. D., 1390
Sitch, L., 1185
Sitobion avenae, barley yellow dwarf virus vector, on oats, 942
Sivan, A., 198, 1159, 1172
Skaria, M., 1193
Skelly, J. M., 1144, 1220
Skinner, D. Z., 1005
Slaughter, G. W., 768
Smallidge, P. J., 1221
Smilanick, J. L., 1171, 1215
Smiley, R. W., 1217
Smillie, R., 921
Smith, B. J., 376, 1193
Smith, D. A., 844, 1204
Smith, D. H., 1140, 1176
Smith, F. D., 1170, 1171
Smith, G. R., 230
Smith, J., 911
Smith, O. P., 1157
Smither, M. L., 1201
Sneath, B. J., 1156, 1211
Snow, J. P., 499, 1163, 1212, 1233
Soby, S., 911
Sogotella longifurcifera, Echinochloa ragged stunt virus vector, 235
Soilborne wheat mosaic virus, antigen binding to cylindrical inclusions, 1265, (1266-1270)
Solarization
—models of soil temperature variations, 506
—Verticillium wilt in tomato controlled by, 1194
Solel, S., 1136
Somerville, S. C., 1153, 1205
Sommartya, T., 136
Sommer, N. F., 1377
Somylyai, G., 1178
Song, H. S., 1202, 1203
Soo, F., 1149
Sorghum
—anthracnose of: cultivar and tillage effect, 372; fertilizer effect, 1141
—charcoal rot, nitrogen effect, 1148
—downy mildew, loss assessment with near-isogenic populations, 448
—leaf blight, genotype mixture effect, 1218
Sorghum yellow banding virus
—California isolate, characterization, 646, (648)
—on corn, ultrastructure, 1189
Soybean
—bacterial blight, bacterial motility role in infection, 284
—cyst nematode race 5: occurrence in Alabama, 376; planting date effect, 1192
—cyst-nematode response in cultivars, aldicarb application, 1170
—downy mildew of, resistance to races 2 and 33, 877
—flooding damage, factors, 1223
—fungicide effect on yield, 1203
—*Fusarium* spp. on, pathogenicity, 1146
—glyceollin elicited by, PMG wall glucan, 1150
—glyceollin solicitation in, daidzein and genistein role, 1199
—hypersensitivity, cultivar-specific elicitor, 1144
—moisture content, variability in three cultivars, 1196
—Phomopsis seed decay of, factors, 1192
—Phytophthora root rot: abscisic acid measurement by ELISA, 1238; irrigation effect, 1147
—Rhizoctonia disease, dinitroaniline herbicide interaction, 1148
—Rhizoctonia foliar blight, spatial distribution in early infection, 1163
—seed moisture, variability among seeds, 1140
—*Septoria glycines* on, tolerant plants from organogenic calli, 1202
—stem canker: physiologic specialization in fields, 1175; phytotoxin production by pathogen, 499
—sudden death syndrome: *Fusarium* and cyst nematode relation, 191, (193-195); spatial and temporal distribution, 1219
Soybean dwarf virus, monoclonal antibodies for strain discrimination, 869
Soybean mosaic virus
—isolate differentiation, monoclonal antibodies and trypsin peptide maps, 1261
—resistance response, phenylpropanoid pathway enzymes, 1157
Spaine, P. C., 1209
Spatial analysis
—*Cercosporidium personatum* on peanut, 837
—*Macrophomina phaseolina*, inoculum and disease, 848
Spear, R. N., 539
Specht, L. P., 787, 1166
Spencer, G. F., 170
Sphaeropsis sapinea
—dispersal and pathogenicity in South Africa, seasonal variation, 1220
—morphology and virulence of types A and B, dsRNA, 1143
Spiegel, S., 258
Spielman, L. J., 1145
Spirek, F. J., 1165
Spiroplasma spp., monoclonal antibodies, serological relations, epitopes and identification, 880
—*S. citri*: protein localization using immunofluorescence, 1137; surface proteins, radiolabeling, 1205
Spooner, F. R., Jr., 1190
Spotts, R. A., 121, 910, 912, 1154, 1182, 1187
Spring beauty latent virus, RNA and coat protein properties, comparison with bromoviruses, 1214
Spruce, *Laccaria* spp. on, incompatibility factors and mating competence in Minnesota, 694
Spurr, H. W., Jr., 1145, 1219
Squash
—silvering of leaves, whitefly-mediated, 1213
—silverleaf, sweetpotato whitefly association, 1161
Stace-Smith, R., 911, 912
Stack, J. P., 1209
Stack, R. W., 1005
Staley, J. M., 1169
Stall, R. E., 376, 1210, 1211
Stanghellini, M. E., 912, 1131
Stanosz, G., 1143
Staples, R. C., 1172
Stapleton, J. J., 908, 1137
Stark, D. M., 1284
Starr, J. L., 372
Stasz, T. E., 1159, 1172
Statler, G. D., 1207
Staudinger, J. L., 1004, 1215
Stayton, M. M., 1144
Steadman, J. R., 1028, 1035, 1145
Steffenson, B. J., 1201
Stein, B. D., 1208
Steinegger, D. H., 1006
Stempel, L., 1184
Stemphylium vesicarium, on onion, etiology, 301
Stenger, D. C., 1158, 1161, 1214
Stenotaphrum secundatum, PM-SAD effect on, 1197
Stephens, C. T., 88, 253, 1167, 1184, 1190, 1201, 1223
Stermer, B. A., 1199
Stevens, C., 1177
Stevenson, W. R., 1219
Stewart, J., 1219
Stigmina carpophila, agri-chemical effect on, 1171
Stiles, C. M., 1005
Stipanovic, R. D., 1145
Stipes, R. J., 1170
Stockwell, V. O., 909, 912, 999, 1215
Stover, R. C., 1003
Stowell, L. J., 1219
Strausbaugh, C. A., 1043, 1048
Strawberry
—anthracnose crown rot of, nitrogen source effect, 376
—*Colletotrichum* spp. pathogenic to, 1154
—*Colletotrichum acutatum*: on fruit,

overwinter survival in Ohio, 1154; rain splash dispersal, 1163
—infection related to cell wall components, 1203
—pallidosis disease, dsRNA, 912
—Phytophthora r[illegible] of, splash dispersal in canopy, 425
—red stele disease, race identification criteria, 535
—root infection by *Colletotrichum* and *Glomerella*, 1136
Strawberry mild yellow-edge virus, cloning from dsRNA, 1250
Strelitzia spp., Cylindrocladium leaf spot, in Hawaii, 1217
Streptomyces spp., extracellular pectic enzymes, characterization, 1190
—*S. orientalis*, mycorrhizal spores stimulated by, 1139
—*S. scabies*, on potato, population dynamics, 681
Stromberg, E. L., 1176
Stubbs, H. A., 768
Stuckey, R. E., 1141
Stutz, J. C., 1149
Subba Rao, K. V., 1233
Sugar beet
—bacteria in rhizoplane of, root print technique, 1131, (1133)
—*Polymyxa betae* and beet necrotic yellow vein virus, soil water matric effect, 1223
—*Pythium ultimum* and *Pseudomonas* spp. on seed of, dynamics and damping-off, 709
—*Rhizoctonia* on, binucleates associated with, 83
—Rhizoctonia crown and root rot of, barley straw management, 909
—Rhizoctonia root rot, binucleate *Rhizoctonia* for biocontrol, 1160
—*Rhizoctonia solani* on, AC-2-2 cultures, legume effect, 1167
—soilborne pathogens, in tare soil, 1167
Sugar, D., 1187
Sugarcane
—*Pachymetra chaunorhiza* on roots of: quantitative assay in Australia, 1302, (1303); sampling strategies, 1306
—smut and mosaic virus resistance, independent selection, 1184
Sugarcane mosaic virus, strains
—cytoplasmic inclusions and serological grouping, 1215
—in Louisiana sugarcane, 373
Suheri, H., 1206
Summervill, R. C., 1003
Sumner, D. R., 371, 376, 377, 934, 1147
Sun, C-W. J., 1139
Sun, X. P., 1191
Sundaram, S., 1139
Sundin, G. W., 861
Sunflower, rust resistance in
—new gene Pu_6, 474
—race nomenclature and gene designation, 1232
—Sclerotinia wilt, factors, 1358
Surico, G., 185
Suslow, T. V., 1151, 1160, 1178
Sutton, T. B., 440, 1206
Svircev, A. M., 1154
Swart, W. J., 1143, 1220
Swarup, S., 1156
Sweet clover necrotic mosaic virus
—on alfalfa, molecular cloning of RNAs, 1215
—electrophoretic variability, 1253
Sweet potato, virus disease complex of, in Puerto Rico, 1188
Sweets, L. E., 1187
Syminis, T., 1205
Szabo, L. J., 1209
Szerszen, J. B., 1138, 1151
Sztejnberg, A., 736

Taber, R. A., 372, 375, 1138, 1140, 1151, 1176
Tadesse, W., 1192
Tainter, F. H., 1109, 1114, 1143, 1221
Tamaki, S. J., 1144
Tang, A. Y., 1177
Taniguchi, G. Y., 1155
Tapper, B. A., 1144
Tavantzis, S. M., 1195, 1199, 1205
Taylor, A. G., 1159
Taylor, J., 376
Taylor, J. D., 1171
Teaching, *Brassica* for, rapid-cycling stocks, 1196
TeBeest, D. O., 1173, 1208
Tedford, E. C., 1186
Teliz, D., 357
Teng, P. S., 1137
Teratosperma oligocladium, for control of *Sclerotinia*, 1345
Terhune, B. T., 1173
Tewari, J. P., 783, 1192
Thakur, R. D., 1323
Thal, W. M., 1219
Thanatephorus cucumeris, on bean, fungicide effect, 1179
Therrien, C. D., 478
Thielges, B. A., 805
Thies, K. L., 1167, 1182
Thirumalachar, M. J., 1190, 1193
Thomas, C. E., 376, 1201
Thomas, C. S., 395
Thomas, G. G., 1168
Thomas, P. L., 1169
Thomashow, L. S., 1159
Thompson, D. C., 1168
Thompson, E., 311
Thornburg, R. W, 1004, 1005
Thorson, P. R., 1005, 1147
Thyronectria austro-americana, on honey locust, water stress, 1333
Tiffany, L. H., 1187
Tiirinlahti, T. T. M., 1213
Tilletia spp., on wheat, floret development and teliospore production, 999, (1001)
—*T. fusca*, teliospore germination in, factors, 246
—*T. indica*, teliospores of, isozymes for identification, 596
Timmer, L. W., 1180, 1182, 1276
Tisserat, N. A., 1221
Tissue culture
—citrus tristeza and citrus infectious variegation viruses, growth and morphogenesis, 820, (822, 823, 825)
—tobacco somaclones, analysis of resistance, 600
Tobacco
—black root rot: soil suppressive in North Carolina, 1146; suppression by *Pseudomonas*, iron relation, 584
—blue mold: factors affecting systemic infection, 865; immunized and nonimmunized resistance, leaf surface components, 1024; partial resistance components in six genotypes, 606; resistance, duvatrienediols relation, 267; resistance, genotype differences in duvatrienediols, 271; resistance induced systemically, immunization, 979
—blue mold and tobacco mosaic virus of, systemic resistance, isozymes and peroxidase, 1199
—cell culture, biotinylation, bacterial interaction, 1199
—cell suspensions, hypersensitive reaction induced by bacteria, lipid peroxidation, 555
—disease resistance using somaclones, analysis of variation, 600
—downy mildew and tobacco mosaic virus relation, peroxidase and chitinase, 1150
—phosphonate in tissues of, quantification and significance, 76
—*Pseudomonas syringae* on, hypersensitivity induced by bacteria, 974
—transgenic, chalcone synthase promoter sequences from bean in, analysis, 1199
Tobacco etch virus
—bell pepper pathosystem, weed hosts, 375
—epidemics, models for yield loss estimates, 1213
—on pepper, multiple resistance levels, 814
—proteinase processing, differential cleavage rates, 1158
—VPg of, 1214
Tobacco mosaic virus
—coat protein, elicitor molecule, 1157
—coat protein genes, transgenic plants, 1284
—detection in water using membrane filters, 1173
—in hypersensitive tobacco, virus replication inhibitor recovered, 258
—movement protein, genomic position effect, 1195
—systemic resistance induced after tobacco necrosis virus, 1174
Tobacco necrosis virus, detection in water using membrane filters, 1173
Todd, W. J., 1168
Toler, R. W., 223, 1189, 1197
Tolin, S. A., 156, 1157, 1196, 1214, 1364, 1368
Tomas, A., 1006
Tomato
—anthracnose of, infection and lesion factors in fruit, 1063
—bacterial canker: detection using DNA probe, 311; diagnosis using gas liquid chromatography, 373
—bacterial spot, spread during thinning, management with bactericide, 1190
—*Clavibacter michiganensis*, epidemiology, 1168
—corky root of, temperature effect on disease severity, 1180
—decline, etiology, 1161
—Fusarium crown and root rot, inoculum source and control in greenhouses, 1162
—Fusarium wilt, overseasoning period effect in Florida, 1161
—Harry Fertilizer and Plant Protectant for, 1193
—HMG CoA reductase gene, molecular cloning, 1198
—phosphonate in tissues of, quantification and significance, 76
—Phytophthora root rot: inoculum and irrigation effects, 1180; sodium/calcium ratio and pH, 912
—root knot of, root resistance in thin cell layer cultures, 1208
Tomato bushy stunt virus
—defective interfering RNAs of, sequence analysis, 1195
—inhibition in tobacco protoplasts, 1174
—pH-mobility curve, 661
Tomato ringspot virus
—on grape: variation, 1214; in Virginia, 1196
—in nectarines, ELISA and dot blot hybridization comparison for detection, 1174
Tomato spotted wilt virus
—chrysanthemum susceptible to, thrip relation, 1149
—detection using DNA probes, 1309

—detection, monoclonal antibodies for, 61
—in *Impatiens*, detection using monoclonal antibodies, 1197
—physiochemical analysis of strain, 1157
Tomato yellow leaf curl virus, in plants and insects, rapid detection, 562
Tooley, P. W., 470, 478, 1173
Torrance, L., 869
Tosic, M., 223
Trail, F., 1151
Treeful, L. M., 1006
Trentin, F., 1105
Trevathan, L. E., 1193
Trichoderma spp.: DNAs of, mitochondrial and plasmid, 1212; transformation to hygromycin resistance, 1172
—*T. harzianum*: alkaline tolerance in, selection, 1160; in rhizosphere, role of competition with *Fusarium*, 198; rhizosphere competence, increase after protoplast fusion, 1159; seed treatment in field trials, on eight crops, 1159
—*T. viride*: ethylene biosynthesis-inducing xylanase of, 1071
Trichosporium symbioticum, symbiont on fir engraver beetle, water stress effect, 1164
Trione, E. J., 999
Triticale
—leaf rust of, slow-rusting, hypersensitivity, 101
—leaf rust resistance, inheritance, 731
Tronsmo, A., 1153
Tronsmo, A. M., 1184
Trufem, S. F. B., 1222
Tsai, C. Y., 1180
Tsai, J. H., 1214
Tsao, P. H., 1159
Tu, J. C., 1148
Tubajika, K. M., 1147
Tuite, J., 1101
Tuleen, N. A., 1189
Tumer, N. E., 1284
Tuopay, D. K., 1193
Tuori, R., 1204
Turfgrass, *Pythium* and *Rhizoctonia* in, immunoassay format for detection, 371
Turnip crinkle virus, pH-mobility curve, 661
Turnip mosaic virus, on oilseed rape, genetic control, 1183
Turnip yellow mosaic virus, human interferon effect on infection, 1158
Tuskan, G. A., 444
Tuzun, S., 267, 979, 1024
Tyler, L. J., 127, 380
Tylka, G. L., 1139
Tzeng, D. D., 1170
Tzeng, T., 1173, 1204

Uchida, J. Y., 1212, 1217
Uddin, W., 1217
Ullman, D. E., 1194
Uncinula necator
—on grape, novel foliar fungicide for, 1170
—on grapevine, overwintering population density, 1163
Upchurch, R. G., 213, 1136, 1172, 1192, 1198
Upper, C. D., 1162, 1290, 1293
Urban, L. A., 488
Uromyces appendiculatus
—on bean: density-dependent fitness interaction, 409; factors affecting lesion size, 1035; isozyme variation, patterns, 1208; resistance and leaf development stage, 1028, (1031); temporal and spatial development from line source, 146
—infection structure induction, heat shock, INF genes, 1172
—phenotypic diversity detected, use of restriction fragment length polymorphisms, 1209
—virulence associations in collections, measurement, 1209
Ustilago spp.
—*U. avenae*, triadimenol resistance, induction, 1170
—*U. hordei*, protoplast production of, technique, 1205
—*U. nuda*, mycelial growth carboxin effect, 1169
—*U. scitaminea*, sorus production and teliospore dissemination in Louisiana, 1218
—*U. syntherismae*, on crabgrass, infection and development, 1202

Vaillancourt, L. J., 1200
Valverde, R. A., 1189, 1197, 1214
Vanavichit, A., 909
van Bruggen, A. H. C., 910, 912, 1182
van den Heuvel, J. F. J. M., 963
Van Deusen, R. A., 1261
Van Maren, A. F., 1161
Van Vuurde, J. W. L., 1178
Vargas, J., Jr., 1153
Varney, E. H., 1154
Vayda, M. E., 1190
Vela, C., 1174
Velicheti, R. K., 1006
Venette, J. R., 1212
Venturia inaequalis
—on apple, predicting infection periods, Mills's criteria, 304
—ascospore detection, spore dot ELISA for, 1222
—benomyl resistant strains cloning, 1153
—cutinase from, characterization, 278
—flusilazole for, sensitivity, 1171
Vera Cruz, C., 1136
Verdegaal, P. S., 1137
Vergel de Dios, T. I., 1184
Verticillium spp., on potatoes, assay using ELISA, 1139
—*V. dahliae*: on cotton, phytoalexins, 1145; on tomato, races 1 and 2, vegetative compatibility analysis, 1176
Vesonder, R. F., 1196
Vilgalys, R., 1147, 1186
Villalobos, F., 1179
Villalon, B., 377, 1214
Vincelli, P. C., 493, 909, 1147
Viroids, pathogenesis, transgenic plant approach to study, 1195
Viruses
—antigen concentration in plant sap, calibration with ELISA, 1175
—arthropod vectors, stochastic simulation model, 1135
—bacilliform, non-enveloped, molecular characterization, 1158
—closterovirus, cytopathology and ultrastructure, 357, (358, 359); pineapple wilt caused by, 1337, 1341
—cucurbits: incidence in Louisiana, 1189; in Hawaii, 1194
—detection and diagnosis, rapid detection in squashes, 562
—dianthoviruses, electrophoretic variability in, 1253
—in drainage water, in British Columbia, 911
—endogenous antiviral proteins, self-recognition implications, 1189
—geminiviruses, on cucurbit, nucleic acid probe for detection, 1123
—green and white ash affected by infection, 579
—isometric, agarose gel electrophoretic pH-mobility curves, 661
—leaf-feeding beetles as vectors, infection loci, 376
—Ouchterlony serological reactions, relationships, 371
—potyviruses, cytoplasmic inclusion proteins of, antisera, 1174
—RNA virus-specific ribonucleoprotein complexes, detection in cell extracts, 1158
—serological identity in ELISA, theory of testing, 1174
—on stone fruits, ELISA testing program in California, 911
—weed hosts for, 65
Vitis spp.
—*V. rotundifolia*, *Agrobacterium*-free plants, shoot tip propagation, 1167
—*V. vinifera*, *Phomopsis viticola* on, chemical control, 1169
Vivoda, E., 1161
Vogeli, U., 979
Vogler, D. R., 1164
Voisard, C., 584
Voland, R. P., 1006
Volney, W. J. A., 1166
Voloudakis, A. E., 1181
von Broembsen, S. L., 1185, 1219
von Wechmar, M. B., 385
Vu, J. C. V., 1200

Wacker, T. L., 1201, 1223
Wagner, R. E., 1003, 1006
Wainshilbaum, S. J., 1216
Walker, D. C., 1198
Walkinshaw, C. H., 371, 1165, 1220
Wall, G. C., 448, 1191
Walla, J. A., 444
Walsh, J. A., 1183
Waney, V. R., 1211
Wang, A. S., 1183
Wang, X., 1186
Ward, E. W. B., 1238
Wargo, P. M., 1150
Warren, H. L., 1148, 1180
Waterhouse, P. M., 1215
Watermelon
—downy mildew of, sugar content relation, 1162
—fruit blotch, control by seed heat-treatment, 1191
—Fusarium wilt: induced resistance, 856; in fields, 375
—potyviruses of, oil and endosulfan effect, 1161
Watermelon mosaic virus, monoclonal antibodies, characterization, 1213
Watkins, J. E., 1006
Webb, S. E., 1161
Webby, G. N., 1174, 1213, 1214
Webster, R. K., 1218
Weeks, J. R., 1169
Weicht, T. R., 912
Weidemann, G. J., 1208
Weingartner, D. P., 1161
Weller, D. M., 1159
Wells, H. D., 377
Wells, J. M., 610
Welty, R. E., 912
Wen, F., 1174
Werder, J., 1390
Westcott, S. W.,III, 1193
Weste, G., 417
Wheat
—bunt of, floret development and teliospore production, 999, (1001)
—Cephalosporium stripe, decline in monoculture, 1127; inoculum density and pH effect, 1166
—common root rot of, tillage and crop rotation effect, 1141
—conservation-tillage and relation to straw residue and *Pyrenophora* colonization, 1163

—disease control by fungicides, evaluation, 1006
—foliar diseases, triazole effect, 1206
—leaf diseases of, fungicide application and scheduling, 1141
—leaf rust: adult-plant resistant, temperature effect, 391; avirulence to Buck Manantial, 1201; disease gradient model, 241; *Lr* gene combinations, 1216; multiple regression model, 1233; physiologic specialization, 1218; race survey in Canada, 349; resistance in land cultivars, 1183; seedling response at two temperatures, 1200
—leaf rust and stem blotch, fungicides for, 1171
—*Mycosphaerella graminicola* on, role in California, 1141
—powdery mildew: triadimenol seed and foliar treatments for, in North Carolina, 152; yield loss and disease assessment methods, 462
—powdery mildew and leaf rust, yield reduction in North Carolina, 371
—powdery mildew resistance, genes in soft red winter wheat, 1201
—*Pyrenophora tritici-repentis* and *Septoria nodorum* competition on leaves of, replacement series, 1217
—rhizosphere of, root pathogens related to *Pseudomonas* populations, 1159
—rhizosphere bacteria, take-all relation, 1166
—root rot: head blight, and leaf rust, biocontrol, 990; rotation and tillage effect, 1142
—rusts of, integrated control in Northwestern USA, 1222
—*Septoria tritici* on, Hagborg device for inoculation, 1003
—Septoria tritici blotch, yield protection, 1183
—soilborne pathogens, yield constraints, 1142
—soilborne wheat mosaic virus infection, antigen binding to cylindrical inclusions, 1265, (1266-1270)
—strawbreaker foot rot: epidermal cell response, 1043; resistance inheritance, 1048
—stripe rust of, resistance genes in differential cultivars, 1207
—take-all suppression, sorghum doublecropping system, 1166
—tan spot: cytoplasmic or maternal determinants, 1184; primary inoculum and disease progress, 873; tillage system and spatial pattern, 1135
—toxin relation to disease, 740, (743)
—virus: from downy mildew-infected plants, 1215; of, in New York, 1148
Wheat soilborne mosaic virus
—chemical fixative effect, 1195
—tiller maturity relation, 1003
Wheat streak mosaic virus
—on corn, resistance gene on chromosome 6, 1188
—genome, cDNA cloning, 1195
—planting date and inoculation date effects, 1004
—resistance, new source, 1189
Wheeler, M. H., 1212
Wheeler, T. A., 1135
White clover, Cercospora leafspot, spatial pattern in clover/grass pastures, 1163
White, F., 1005, 1136, 1145, 1157, 1178
Whitehead, M. D., 1190, 1193
Whitesides, S. K., 912, 1182
Whitlock, V. H., 1182, 1212
Wick, R. L., 1149
Wicks, Z. W.,III, 70, 1185, 1201
Widholm, J. M., 1202
Wieczorek, A., 912
Wiersma, J. V., 1006
Wigginton, T. C., 1221
Wiglesworth, M. D., 267, 271, 1203
Wilcox, W. F., 93, 530
Wilcoxson, R. D., 1006
Wilkinson, H. T., 1006
Williams, E., Jr., 1006, 1206
Williams, J. A., 1215
Williams, L. E., 1216
Williams, P. H., 1196, 1207
Williamson, J. W., 1223
Willis, D. K., 1178
Wilmot, V. A., 1175
Wilson, C. L., 1184, 1187, 1387
Wilson, C. W., 1215
Wilson, J. P., 101, 377, 731, 1180
Wilson, L. L., 1154, 1163
Wilson, M. A., 1177
Windels, C. E., 83, 1006, 1167
Windham, M. T., 374, 377, 1149
Wingfield, M. J., 1143, 1220
Winter, W. E., 1136
Wisler, G. C., 1213
Wisniewski, M. E., 1187, 1215
Wokoma, E. C. W., 800
Wolf, G., 990
Wolf, R., 1143
Woloshuk, C. P., 1204
Wong, S.-M., 1149
Wood, D. L., 768
Wood, S. C., 1139
Woodward, R. P., 1146
Worawitlikit, O., 1135
Worrall, J. J., 290
Wright, J. M., 372
Wrobel, A. L., 1006
Wrubel, R. P., 1216
Wu, H., 1005
Wu, N.-T., 1143
Wyatt, J. E., 372
Wyllie, T. D., 1166, 1167, 1180
Wynn, W. K., 1175

Xanthomonas spp., promoter-active fragments from, characterization using selection vector, 1156
—*X. campestris*: alternate host for, 1218; on anthurium, growth and lesion fusion model, 1218; antigenic determinants, stability, detection by monoclonal antibodies, 1191; avirulence gene from, characterization, 1178; bacteriophage in strains of, non-lytic, 1182; on bean, plasmid DNA probe for detection, 518; on citrus, from canker lesions and epiphytic survival, 1182; on citrus, histopathology, 336, (337-347); on citrus, histopathology and strain comparison, 329, (330-334); on citrus, isozyme analysis, 297; on citrus, restriction fragment length polymorphisms, 793; on citrus, serological identification of isolates, 780; on citrus, strains epidemic in Florida, 376; citrus bacterial spot association, aggressiveness, 1182; on citrus nurseries, analysis of disease in Argentina, 1276; copper resistance operon of, homology with *Pseudomonas syringae* and *Erwinia herbicola*, 1179; copper-resistant strains of, plasmid, 1192; on crucifer seeds, selective media, 1140; on crucifer seeds, selective medium for isolation, 372; extracellular protease of, 1199; extracellular protease produced by, strains, 1191; genomic fingerprint of, 745; medium for isolation, 1191; monoclonal antibodies for pathovars, 1178; pathogenicity genes, cloning and characterization, 1210; perennial hosts for, epiphytic populations, 1168; pigment synthesis genes, molecular cloning for identification, 1182; protease mutants of, growth evaluation in plants, pathogenicity, 1210; on rice, growth dynamics in cultivar leaves, 573; on rice, infection through hydathode, 433, (434); on rice, multiplication dynamics in mixed races, 1004; on rice, pathovar identification using monoclonal antibodies, 322; on rice, strains, low-virulence, 984; seed treatment, dry heat, 1181; strains from Ambarella, in French West Indies, 1191; streptomycin resistance, plasmid association, 1210; Tn5-induced mutations of, host-species specificity, 1156; in tomato, avirulence gene for hypersensitivity, 1211; on tomato seeds, Tween medium for detection, 1140; transposon mutagenesis, 1211; xanthomonadin production, genetics, 1211
—*X. officinarum*, on sugarcane, gumming disease organism, 1191
Xie, W., 1186
Xiong, Z., 1194
Xu, G.-W., 1210, 1390
Xylella fastidiosa
—on elm, survey, 1165
—factors affecting vector feeding, 1137

Yahata, P. S., 1217
Yang, S. M., 474
Yang, X., 1163, 1219
Yang, X. B., 1163, 1212, 1233
Yang, Z., 1150, 1200
Yao, B., 1101
Ye, X. S., 1150, 1199, 1200
Yeh, S.-D., 1257
Yokomi, R. K, 1161
Yoshikawa, N., 912
Young, C. S., 1177
Young, R. J., 1145, 1169
Young, S. A., 1211
Yourman, L., 1187, 1216
Yuan, W., 377, 1190, 1191
Yucel, I., 1208
Yuen, J. E., 1155, 1218

Zadoks, J. C., 1141
Zagula, K. R., 451, 1195
Zambino, P. J., 1185
Zehr, E. I., 1193
Zeyen, R. J., 1198
Zhang, L., 1175, 1197
Zhang, W., 1152, 1163
Zink, F. W., 1201
Zipf, A., 1189
Zitter, T. A., 1175, 1197
Zook, M. N., 1151
Zucchini yellow mosaic virus
—coat protein gene, sequence analysis, 1194
—monoclonal antibodies, characterization, 1213
Zummo, N., 1142
Zumoff, C. H., 1156, 1211